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PRIMITIVE WARFARE, SECTION II. ON THE RESEMBLANCE OF THE WEAPONS OF EARLY RACES; THEIR VARIATIONS, CONTINUITY, AND DEVELOPMENT OF FORM.

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General Remarks.

IN June 1867, I had the honour of reading a paper at this Institution, which has since been published in its Journal, the object of which was to point out the resemblance which exists between the weapons of savages and early races and the weapons with which nature has furnished animals for their defence..

In continuation of the same subject, my present communication will relate to the resemblance to each other of the weapons of races sometimes widely separated, and of which the connection, if it ever existed, has long since been consigned to obscurity. I shall endeavour to show, how in these several localities, which are so remote from one another, the progress of form has been developed upon a similar plan and, though to all appearance independently, yet that under like conditions like results have been produced, and that the weapons and implements of these races will sometimes be found to bear so close a resemblance to each other, as often to suggest a community of origin where no such common origin can have existed, unless at the very remotest period.

We shall thus be brought to the consideration of the great problem of our day, viz., the origin of mankind, or rather the origin of the human arts; for the question of man's origin, whether he was himself created or developed from some prior form, whether since the period of his first appearance he has by variation separated into distinct races, or whether the several races of mankind were separately created, are

questions which, however closely allied, do not of necessity form part of our present subject. It has to deal solely with the origin of the arts and more particularly with the art of war, which in the infancy of society belonged to a condition of life so constant and universal as to embrace within its sphere all other arts, or at least to be so intimately connected with them as to require the same treatment, the tool and the weapon being, as I shall presently show, often identical in the hands of the primeval savage.

These prefatory remarks are necessary because it will be seen that the general observations I am about to offer on the subject are fully as applicable to the whole range of the industrial arts of mankind as to the art of war. My illustrations, however, will be taken exclusively from weapons of war.

Is not the world at the present time and has it not always been the scene of a continuous progress? Have not the arts grown up from an obscure origin, and is not this growth continuing to the present day?

This is the question which lies at the very threshold of our subject, and we must endeavour to treat it by the light of evidence alone, apart from all considerations of a traditional or poetic character.

I do not propose here to enter into a disquisition upon the functions of the human mind. But it must I think be admitted, that if man possessed from the first the same nature that belongs to him at the present time, he must at the commencement of his career in this world have been destitute of all creative power. The mind has never been endowed with any creative faculty. The only powers we possess are those of digesting, adapting, and applying by the intellectual faculties, the experience acquired through the medium of the senses. We come into the world helpless and speechless, possessing only in common with the brutes, such instincts as are necessary for the bare sustenance of life under the most facile conditions; all that follows afterwards is dependent purely on experience.

Whether we afterwards become barbarous or civilized, whether we follow a hunting, nomadic, or agricultural life, whether we embrace this religion or that, or attain proficiency in any of the arts, all this is dependent purely on the accident of our birth which places us in a position to build upon the experience of our ancestors, adding to it the experience acquired by ourselves. For although it is doubtless true that the breeds of mankind, like the breeds of our domestic animals, by continued cultivation during many generations have improved, and that by this means races have been produced capable of being educated to a higher degree than those which have remained uncivilized, this does not alter the fact that it is by experience alone, conscious or unconscious, self imposed or compulsory, and by a process of slow and laborious induction, that we arrive at the degree of perfection to which according to our opportunities and our relative endowments, we ultimately attain.

The amount, therefore, which any one individual or any one generation is capable of adding to the civilization of their age must be immeasurably small, in comparison with what they derive from it.

I could not perhaps appeal to an audience more capable of appreciating the truth of these remarks than to the members of an Institution, the object of which is to examine into the improvements and so-called inventions which are from time to time effected in the machinery and implements of war.

How often does any proposal or improvement come before this Institution which, after investigating its antecedents, is found to possess originality of design? Is it not a fact that even the most ingenious and successful inventions turn out on enquiry to be mere adaptations of contrivances already existing, or that they are produced by applying to one branch of industry the principles or the contrivances which have been evolved in another? I think that no one can have constantly attended the lectures of this or any similar Institution, without becoming impressed, above all things, with the want of originality observable amongst men, and with the great calls which, even in this age of cultivated intellects and abundant materials to work upon, all inventors are obliged to make upon those who have preceded them.

Since then we ourselves are so entirely creatures of education, and derive so little from our own unaided resources, it follows that the first created man, if similarly constituted, having no antecedents from which to derive instruction, could not, without external aid, have made any material or rapid advance towards the initiation of the arts.

So fully has the truth of this been recognised by those who are not themselves advocates for the theory of development, that in order to account for the very first stages of human progress they have found it necessary to assume the hypothesis of supernatural agency; such we know was the belief of the classical pagan nations, who attributed the origin of many of the arts to their gods; such we know to be the tradition of many savage and semi-civilized nations of modern times that have attained to the first stages of culture. But we have already disposed of this hypothesis at the commencement of these remarks, by deciding that our arguments should be based solely upon evidence. We are, therefore, under the necessity of assuming, in the absence of any evidence to the contrary, that none but the agencies which help us now were at the disposal of our first ancestors, and the alternative to which we must have recourse is that of supposing that the progress of those days was immeasurably slower than it is at present, and that vast ages must have elapsed after the first appearance of man before he began to show even the first indications of a settled advance.

Yet the complex civilization of our own time has been built on the foundations that were laid by these aborigines of our species, while the brute creation may be said to have produced little more than was necessary to their own wants or those of their immediate offspring. Man has been the agent employed in a work of continuous progression. Generation has succeeded generation, and race has succeeded race, each contributing its quota to the fabrication of the edifice and then giving place to other workmen. But the progress of the edifice

itself has never ceased, it has gone on, I maintain, contrary to the opinion of some writers of our day; always in fulfilment of one vast design. It is a work of all time.

To study it comprehensively, we must devote ourselves to the contemplation of the edifice itself, and set aside the study of mankind for separate treatment, for it is evident that man has been fashioned, not as the designer, but simply as the unconscious instrument of its erection. Each individual has been impelled by what,—viewed in this light,—may be regarded as instincts sufficient to stimulate him to labour, but falling immeasurably short of a comprehensive knowledge of the great scheme, towards which he is an unconscious contributor. Of this he knows no more than the earthworm knows it to be its function to cover the crust of the earth with mould, or the small coral polypus knows that it is engaged in the erection of a barrier reef. No comprehensive scheme of progress need be searched for in the pigmy intellect of man, and if we are ever destined to acquire any knowledge of the laws which influence the growth of civilization, we must look for them in an investigation of the phenomenon itself, by studying its phases and the sequence of its mutations. In short we must apply to the whole range of human culture, to the arts, whether of peace or war, the same method which has already been applied with some success to the history of language.

It has been shown that the speech of our own day has been the work of many generations and of innumerable distinct races; its roots are traceable in the utterances of the untutored savage. No nation ever consciously invented a grammar, and yet language has been shown to be capable of being treated as a science of natural growth, having its laws of mutation and development, never dreamt of by any of the many myriads of individuals that have unconsciously contributed to the formation of it. May not all the products of human intellects in the aggregate be made amenable to the same treatment, and like language be found to be influenced by laws of evolution and progress?

That these remarks are not merely speculative, that the progress of civilization has been continuous and connected, while the races which have been engaged in the formation of it, like individuals, have had their periods of birth, maturity, and decay, is sufficiently proved by history.

In Egypt and in Assyria, we see the remains of ancient and formerly populous cities, where now the nomadic Arab pitches his tent or wanders with his flocks, thus showing that relapses of civilization must have occurred in those particular localities where such phenomena are observed. But we know also from history that the civilization which once flourished in those countries did not expire there, but was transferred thence to other places; that the culture of Assyria and of Egypt passed into Greece and developed there; that from Greece it extended to Rome, and in the hands of a new people passed through fresh phases; that after the destruction of the Roman empire it lay dormant for many ages, only to rise again on its original basis extended and fertilized by the introduction of fresh blood; that we ourselves

are the inheritors of the same arts, customs, and institutions, modified and improved; and finally that civilization expanding in all directions, as it continues to move westward, is now in process of being received back by those ancient countries in which it originated, in a condition far more varied and diversified than it could ever have become, had it been confined to a single people or country.

Passing now from the known to the unknown, we come to the study of pre-historic times prepared to find that every fresh discovery helps us to trace backwards the arts of mankind in unbroken continuity towards their source.

Commencing with the Saxon and the Celt, and passing from these to the lake dwellers, and on to the inhabitants of caves, races whose successive periods of existence are determined chiefly by the animals, with which their remains are associated, we find that according to their antiquity, they appear to have lived in a lower and lower condition of culture, until in the drift period, coeval with the extinct mammoth and the woolly haired rhinoceros, we find the earliest traces of man, scanty and unsatisfactory though they be, yet sufficient to show that he must have existed in a state so rude, as to have devised no better implements than flints pointed at one end, and held in the hand.

These successive pre-historic stages of civilization have been divided into the stone, the bronze, and the iron ages of mankind. The evidence upon which this classification is based, has been so ably set forth in the works of Sir John Lubbock and others, that I need not refer to it further than to state that, in my treatment of the origin and development of the weapons of war, I shall in a great measure follow the same arrangement. But I shall endeavour to trace the development of *form* rather than the *material* of weapons, and to show by examples taken from various distinct periods, and especially by illustrations taken from existing savages, the various agencies which appear to have operated in causing progression during the earliest ages of mankind.

Of these, the first to be considered, is undoubtedly the utilization and imitation of natural forms. Nature was the only instructor of primeval man.

In my previous paper, I discussed this subject at some length, giving many examples in which the weapons of animals have been employed by man. But besides these weapons derived from animals, primeval man must no doubt at first have employed the natural forms of wood and bone, and of stones either fractured by the frost, or rolled into convenient forms upon the sea-shore.

This principle of the utilization and imitation of natural forms appears to bear precisely the same relationship to the development of the arts, that in the science of language, onomatopœia has been shown to bear to the growth and development of articulate speech. In the attempt to trace language to its origin, onomatopœia, or the imitation of the sounds of animals and of nature, appears not only to have been the chief agent in *initiating* the growth of language, but it has also served to enrich it from time to time, so that even to this day, poetry

and eloquence in a great measure depend on the employment of it. But apart from this, language has had an independent and systematic growth of its own.

So in like manner, men not only drew upon nature for their ideas in the infancy of the arts, but we continue to copy the forms and contrivances of nature with advantage to this day. But apart from this, we must look for an independent origin and growth, in which form succeeded form in regular continuity. Many a lesson has still to be learnt from the book of nature, the pages of which are sealed to us until by the natural growth of knowledge, we acquire the power of reading and applying them. Imitation therefore, though an important element in the initiation of the arts, would not alone be sufficient to account for the phenomenon of progress.

The next principle which we shall have to consider, is that of variation. Amongst all the products of the most primitive races of man, we find endless variations in the forms of their implements, all of the most trivial character. A Sheffield manufacturer informed me, that he had lately received a wooden model of a dagger-blade from Mogadore, made by an Arab, who desired to have one of steel made exactly like it. Accordingly, my informant thinking that he had found a convenient market for the sale of such weapons, constructed some hundreds of blades of exactly the same pattern. On arriving at their destination, however, they were found to be unsaleable. Although precisely of the type in general use about Mogadore, and all of which to the European eye would be considered alike, their uniformity rendered them unsuited to the requirements of the inhabitants, each of whom piqued himself upon possessing his own particular pattern, the peculiarity of which consisted in having some almost imperceptible difference in the curve or breadth of the blade.

In the earliest stages of art, men would of necessity be led to the adoption of such varieties by the constantly differing forms of the materials in which they worked. The uncertain fractures of flint, the various curves of the trees out of which they constructed their clubs, and the different forms of bones, would lead them imperceptibly towards the adoption of fresh tools. Occasionally some form would be hit upon, which in the hands of its employer, would be found more convenient for use, and which by giving the possessor of it some advantage over his neighbours, would commend itself to general adoption. Thus by a process, resembling what Mr. Darwin, in his late work, has termed "unconscious selection," rather than by premeditation or design, men would be led on to improvement. By degrees some forms would be found best adapted to one pursuit, and some to another; one would be used for grubbing up roots, another for breaking shells, another for breaking heads; modes of procedure accidentally hit upon in one class of occupation, would suggest improvements in another, and thus analogy, coming to the aid of accidental variation, would give an impulse to progress. Thus would commence that ramification of the arts, occupations, and sciences which developing simultaneously and assisting each other, has born fruit in the civilization of our own times.

I am aware that it will be found extremely difficult to realize a con-

dition of human existence so low as that which I am supposing, and that many persons will deny the possibility of mankind having ever existed in a condition so helpless as to have been incapable of designing the simple weapons which we find in the hands of savages at the present day. It is as difficult to place one's self in the position of a being infinitely one's inferior, as of a being greatly one's superior in intellect. "Few persons," says Professor Max Müller, "understand children, still fewer antiquity." Our own experience cannot save us in estimating the powers of either, for long before the period of which we have the earliest recollection, we had ourselves undergone a course of unconscious education in the arts of a civilized community; our very first utterances were in a language which was in itself the complex growth of ages, and the improvement of our natural faculties resulting from the continued cultivation of our race, enhances the difficulty we find in appreciating the condition of our first parents.

Another fertile source of variation arises from errors in successive copies. At a time when men had no measures or other appliances to assist them in copying correctly, and were guided only by the eye, an implement would soon be made to assume a very different appearance. Mr. Evans has shown in his work on "Ancient British Coins" how the head of Medusa, copied originally from a Greek coin, was made to pass through a series of apparently meaningless hieroglyphics, in which the original head was quite lost, and was ultimately converted into a chariot and four. We must not, however, attribute all variation to this cause, for I quite agree with a remark made by Mr. Rawlinson in his "Five Ancient Monarchies," that such varieties are more frequently noticed in cases where the contrivance is of home growth, than in those which are derived from strangers.

The third point which we shall have to consider in relation to continuity, is the retarding element. Under this head, incapacity must at all times, and especially in the infancy of society, have played the chief part. But as civilization progressed, other agencies would come in to influence the same result, prejudice, force of habit, principles of conservatism in which we have been told by Mr. Mill that all the dull intellects of the world habitually ensconce themselves, a thousand interests of a retarding tendency, rise up at the same time as those having a progressive influence, and prevent our advancing by other than well-measured paces.

The resultant of these contending forces is continuity. If we could but put together the missing links; if we could revive contrivances that have died at their birth, and expose piracies; if we could penetrate the haze that is so often thrown over continuity by great names, absorbing to themselves the credit of contrivances that belong to others, and thereby causing it to appear that progress has advanced with great strides, where creeping was in reality the order of the day; we should find that there is not a single work of man's hand which has not its history of slow and continuous development, capable of being traced back, like branches of a tree, to its junction with others, and so on until the roots of all are found to lie in the simplest contrivances of primeval man.

But we must not expect that we shall be able, in the existing state of knowledge, to trace this continuity from first to last, for the links that are lost, far exceed in number those which remain. The task may be compared to that of putting together the fragments of a tree that has been cut up for firewood, and of which the greater part has been burnt. It is only here and there, after diligent search, that we may expect to find a few pieces fitting in such a manner as to prove that they belonged to the same branch. We do not, on that account, abandon our conviction that the tree once grew, that every large branch was once a small twig, and that every limb developed by a natural process into the form in which we find it. The difficulty we have to contend with, is precisely that which the geologist experiences in tracing his palæontological sequence. But it is far greater, for natural history has been long studied, and the materials upon which Mr. Darwin founds his celebrated hypothesis have been in process of collection for many generations. But continuity, in relation to the arts, can scarcely yet be said to be established as a science. The materials for the science have not yet been even classified, and classification is a process which must always precede continuity in the study of nature. Classification defines the margin of our ignorance; continuity results from the extension of knowledge by bridging over the distinction of classes. Travellers, for the most part, have been in the habit of bringing home, as curiosities, the most remarkable specimens of weapons and implements, without much regard to their history or the evidence they convey, and their descriptions of them, as a general rule, have been extremely meagre. Until quite recently, the curators of our ethnographical museums have aimed more at the collection of unique specimens, serving to exhibit well-marked differences of form, than such as by their resemblance enable us to trace out community of origin. The arrangement of them has been almost universally bad, and has been calculated rather to display the several articles to advantage, on the principle of shop windows, than to facilitate the deductions of science. The antiquities of savage races, moreover, have as yet been almost wholly unstudied.

Notwithstanding these difficulties, we are able to catch glimpses of evidence, here and there, which when put together systematically, and when the vestiges of antiquity are illustrated by the implements of existing savages, will, I trust, be found sufficient to warrant the principles for which I contend.

Combination of Tool and Weapon.

In the earliest ages of mankind, when all men were warriors, and before the division of labour, consequent on civilization, had separated the arts of peace and war into distinct professions, we must expect to find the same implement frequently employed in the capacity of both tool and weapon. Even long after the very earliest ages of which we have any historical or archæological record, we often find a combination of tool and weapon in the same forms, especially amongst those semi-civilized and savage races of our own times, whom we regard as

the representatives of antiquity. The battles of liberty, from the age of the Jews and Philistines down to the time of the last Hungarian revolution, have always been fought by the subject people with weapons made out of the implements of husbandry. We read in the first of Samuel, chapter xiii, "Now there was no smith found in all the "land of Israel, for the Philistines said, lest the Hebrews make them "swords or spears; but all the Israelites went down to the Philistines "to sharpen every man his share" (the blade of the ploughshare), "and his coulter" (a kind of knife), "and his axe, and his mattock" (a kind of pickaxe). . . . . "So it came to pass, in the day of "battle, that there was neither sword nor spear found in the hand of "any of the people that were with Saul and Jonathan." In the revolts of the German peasantry, in the fifteenth and sixteenth centuries, the bands of insurgents armed themselves with threshing flails and scythe blades. In 1794 and 1831, the Polish peasantry were similarly armed;* and it was from such implements of husbandry that weapons like the military flail, the bill, and the yatagan, derived their origin. In the recent outbreak in Jamaica, which, had it not been ably and powerfully put down, would have led to the destruction of the whole white population, the negroes armed themselves with weapons of husbandry. In the proclamation of Paul Bogle, he says: "Every "one of you must leave your house, take your guns; who don't have "guns, take cutlasses." The cutlasses here referred to, were the implements used for cutting the sugar cane, sharp on the concave edge, and are the same which, having been used as weapons by the negroes in their own country, have continued to be employed by them ever since. In like manner, we learn from Symmes's embassy to Ava, in 1795,† that the Burmese use the sabre both for warlike purposes, as well as for cutting bamboos, felling timber, &c.; it is the constant companion of the inhabitants for all purposes, and they never travel without it. In Borneo, the peculiar sword-like weapon, called the parangilang, is used both as a weapon, and also for felling trees, and the axe of this country is constructed so that, by turning it on the helve, it can be used either as a weapon or as a carpenter's axe. In like manner, the Caffre axe-blade, by simply altering its position in the handle, is used either as a weapon, or for tilling the ground. The North American Indian tomahawk, like the Caffre axe, is used for many different purposes; the spear head of the Caffre assegai is the knife that is used for all purposes of manufacture, and Captain Grant says that the Watusi of East Central Africa make all their baskets with their spear heads.‡ The weapons edged with sharks' teeth, to which I referred in my former paper, are used in the Marquesas and other of the South Sea Islands, as much for cutting up fish and carcasses as for warlike purposes.§ Dr. Klemm, in his valuable work on savage and early weapons, describes the wooden pick used by the inhabitants of New Caledonia both as a weapon, and also for tilling the ground, and he gives reasons for supposing that in Egypt and many other parts of the world, the form

* Klemm.
† Pinkerton vol. ix, p. 500.
‡ Walk across Africa, p. 78.
§ Klemm.

of the plough was originally derived from that of the hatchet or hoe, used for tilling purposes. The hoe used in East Central Africa, which also, like the Caffre axe, serves as a medium of exchange in lieu of money, evidently derived its form from that of a spear or arrow head. The spade formerly used in this country, and represented in old pictures, and which is still used as a shovel in Ireland, is a pointed spear-like instrument, and the loy or spade still used in all parts of Ireland is hafted exactly in the same manner as the bronze celt of pre-historic times. Dr. Klemm gives an illustration of an axe used by the Norwegian peasants both as a tool and weapon. Speke describes the Usoga tribe as being armed with huge short handed spears, adapted rather for digging than for war; and Barth describes the Bornouese troops in Central Africa digging holes with their spears, and employing them in searching for water. The Australian "dowak," a kind of club with a flint attached, combines the purposes of a tool and weapon. We know from the short sticks upon which the small arrow heads of quartz found in the Peruvian tombs are mounted, that they must have been used as knives as well as for missile purposes. Professor Nilsson says that flint-barbed arrow heads, of precisely the same form, are used by the inhabitants of Terra del Fuego as knives, and Mr. Stephens, in his travels in Central America, shows reason for supposing that the large stone idols in Copan, were carved with similar arrow points,* no other instrument capable of being used for such a purpose having been found in the neighbourhood.

Examples of this class of evidence might be multiplied *ad infinitum;* but enough has already been said to afford good grounds for believing that many of the implements of stone and bronze which are found in the soil, may have been used for a great variety of purposes, and that, especially in the earliest stages of culture, we must be careful how we attribute especial purposes to tools and weapons because they appear to differ from each other slightly in form. This is more especially so when, as is almost invariably the case, the several distinct types are found—when a sufficient number of them are collected and arranged—to pass almost imperceptibly into each other by connecting links, showing that the differences observable between any two implements of the same class, when brought together and contrasted, are rather due to the operation of a law of variation and development in the fabrication of the tool itself, than to an intention on the part of the constructor to adapt it to particular purposes, and that its application to such especial purposes must have followed, rather than itself have influenced, the development of the tool.

Transition from the Drift to the Celt Type (Plate XVII).

My first illustration must of necessity be taken from the flint implements of the drift, the earliest records of human workmanship that the researches of science have as yet revealed to us. These, to use the words of Sir Charles Lyell, "were probably used as weapons both of

* "Stephens' Travels in Central America," page 94.

"war and the chase, to grub roots, cut down trees, or scoop out "canoes."*

I will not attempt during the brief time allotted to me on the present occasion, any detailed account of the evidence of the antiquity of these weapons, assuming that the works of Sir Charles Lyell, and Sir John Lubbock, will have rendered this subject more or less familiar to most persons at the present day, but I will confine myself to pointing out the indications of variation and of improvement observable in the implements themselves.

I have arranged upon Sheet No. 1 of illustrations (Plate xvii), a series of specimens of the same type from nearly every part of the globe.

All the figures given in these illustrations are traced from the implements themselves, and reduced by photography; they may therefore be regarded as fac similes, a point of great importance when our subject has to deal with the minute gradations of difference observable between them. Figures 1 to 11 are of the drift type. Casts of the originals of some of them, and specimens of the implements themselves, are also upon the table for comparison.

I may here acknowledge the great obligations I am under to Mr. Franks for the facilities he has afforded me in drawing many of these specimens in the Christy Collection, to Dr. Watson for a similar permission in regard to the valuable collection of arms in the India Museum, and also to Dr. Birch of the British Museum. A large proportion of my illustrations are taken from the excellent Museum of this Institution, and others are from my own collection.

Of the drift specimens which I have selected as illustrations, five are from the gravel beds of St. Acheul, in order that we might have an opportunity of observing the variation in implements derived from the same locality, and probably belonging to the same or nearly the same period—chips in fact from the same workshop.

It has been usual to classify these drift implements in two divisions; the spear-head form, and the oval form. Of the first or spear-head form, figures 2 to 4 are typical examples; of the oval form, figure 8 is the best illustration. I venture, however, to think that a distinction more clearly embodying a principle of progress may be made by dividing them differently, and by placing in the first class those which are either left rough or rounded at one end and pointed at the other, of which figures 1 to 7 are examples; and in the second class, such as are chipped to an edge all round, of which figures 8 to 11 are types. My reason for preferring this classification to one dependent on outline is this. The first class having the natural outside coating of the flint or a roughly rounded surface on one side, appears to be in every way adapted to be held in the hand; whereas the second class, of which a beautiful specimen in the Christy Collection from St. Acheul is represented in a front and side view in figure 10, could not conveniently be used in the hand as a tool or weapon, without injury to the hand from the sharp edge with which its periphery is surrounded on all sides. If, therefore, we see reason for supposing that one class of implements

* "Antiquity of Man," p. 113.

was employed in handles, whilst the other may have been used in the hand, I think this constitutes a more important distinction, and one more obviously implying progress, than a classification which merely involves a modification of outline, which may have resulted from no more significant cause than a difference in the form of the flint nodule out of which the implement was made.*

Another important distinction between these drift implements as thus arranged, arises from the different purposes to which they may have been put by the fabricators. The first class, figures 1 to 7—it will be seen by the side view of them—could have been used only as spears, picks, or daggers, the pointed or small end being employed for that purpose, whereas the latter class, figures 8 to 11, are equally available for use as axes with the sharp and broad end. It is quite possible therefore, that we may see here, in these vestiges of the first tools of mankind (specimens of all varieties of which are found in the same beds at Acheul), the point of divergence between the two distinct classes, which must certainly be regarded as the two most constant and universal weapons of mankind in all ages and countries of the world, viz., the spear, and the axe; the small end developed into the spear and into all that class of tools for which a point is required, and from the broad end we obtained the axe and all those tools which either as chisels, choppers, gouges, or battle-axes, have continued in use with an endless continuity of development and modification and a world wide history, up to the present time. I am aware that in the St. Acheul implements, as well as in those of similar form from the laterite beds of Madras, we find occasionally specimens in which the small end is made broader, as if indicating the gradual development of an edge on that side, but upon the whole I think the balance of evidence is in favour of the broad end having originated the axe form.

Nothing, it will be seen, can be more primitive than these tools, or more gradual than their development. They are perfectly consistent with the idea that the fabricators of them were in a condition closely verging upon that of the brutes. Apes are known to use stones in cracking the shells of nuts. The advantage to be derived from a pointed form, when it accidentally fell into the hand, would suggest itself almost instinctively to any being capable of profiting by experience and retaining it in the memory. Accidental fractures producing a sharp edge, would lead to fractures by design, and thus we may easily suppose that such implements as are represented in the first few figures on the sheet must necessarily have resulted from the very earliest constructive efforts of primeval man.

From the very first, a peculiar mode of fabrication appears to have been adopted, which consisted of chipping off flakes from alternate sides of the flint, and the facets thus left upon the flint, produce the wavelike edge which you will see in the side views of all the imple-

* I am informed by an eye witness, that the Australian savages, in climbing trees, use implements nearly similar to these, to cut notches for their feet. The implement is held in the hand, without any handle. Others are used in handles, either fastened with gum, or consisting of a withe passed round the stone and tied underneath.—A. L. F.

ments here represented. This method continued to be employed throughout the entire stone age in all parts of the universe, and is characteristic not merely of the drift, but of the cave, pfahlbauten, and surface periods.

The numerous intermediate gradations of form, whether between the oval, and the spear-head form, or between the thick, and the sharp-ended form, have been noticed by Sir Charles Lyell. By selecting specimens, and arranging them in order from left to right, I have endeavoured to trace the transition from the drift type, to the almond-shaped celt type, which latter is common to the stone age of mankind, whether ancient or modern, in all parts of the world.

Had the discovery of drift implements been confined to one locality or to one district, it is probable it would have attracted but little notice. As early as the first year of the present century the attention of the Society of Antiquaries had been drawn by Mr. Frere to the existence of these implements, in conjunction with the remains of the elephant and other extinct animals at Hoxne in Suffolk. An illustration of the specimens from this locality is given in figure 4. Mr. Frere described them as "evidently weapons of war, fabricated and used by a people who had not the use of metals." But little or no attention was paid to the subject until the discovery by M. Boucher de Perthes of precisely similar implements associated with the same class of remains, in the drift gravel of St. Acheul, near Amiens, in 1858.* Since then many other discoveries have been made, and still continue to be made, by Mr. Prestwich, Mr. Evans, Mr. Flower, Mr. Bruce Foote, and others, not only in this country but also in Asia and Africa, shewing, in so far as the discoveries have hitherto gone, that this drift type, like the almond celt type, is common to the earliest ages in all parts of the world, and that everywhere the drift type preceded the almond-shaped celt type, and is found in beds of earlier formation.

Figure 5 is a drift-shaped implement from the laterite beds of Madras, of exactly the same form as those found in England. Figure 6 is an implement of the same class from the Cape of Good Hope, found 14 feet from the surface. In America, implements of the drift type have not yet been discovered, but stone spear heads have been found in Missouri in connection with the elephant and other extinct animals. Figure 11 is from a mound of sun-dried bricks at Abou Sharein, in Southern Babylonia, obtained by Mr. J. E. Taylor, British Consul at Basrah; a cast of it, presented to me by Mr. Franks, is upon the table; it is a chipped flint; in form it is of the drift type, and its outline is precisely that of some of the Carib celts found in the West India Islands; it also closely resembles in form others from the Pacific,† its edge was evidently at the broad end. Another of the same type was found at Mugeyer in Babylonia, and a third closely resembling the two former was found in a cave in Bethlehem.

The celt type has not as yet been found in the French caves of the reindeer period, but it is common in the Pfahlbauten of the Swiss lakes.

* Mr. Frere's first discovery was in 1797.

† See figures 23 and 32, as well as figure 17A from Central India.

Some of the French cave specimens, however, closely approach the drift form, and in place of the celt, we have a peculiar kind of tool trimmed to a cutting edge on one side and having the other round for holding in the hand. As, however, these do not fall into the direct line of development, but may be regarded as a branch variety, I have not figured them on the sheet, but pass at once, though almost imperceptibly as regards form, from the drift to the surface type.

Figure 12 formed part of a large find of flint implements, discovered by myself in the ancient British camp of Cissbury, near Worthing—an account of this discovery was communicated by me to the Society of Antiquaries at the commencement of the present year. The period of these Cissbury implements must be fixed at a very much more modern date than those of the drift, with which they are associated on the sheet, having been found in conjunction with the earliest traces of domestic animals, such as the Bos longifrons, Capra hircus, and Sus; they may, however, be classed with the stone age, no trace of metal having been discovered with them, although from 500 to 600 flint implements were found in the camp. The peculiarity of the Cissbury find, however, consists in the discovery in the same pits in which celts of the type represented in figure 12 were found, of a few flints closely approaching the drift type, being thick at the broad end, and also of a large number resembling those found in the French caves trimmed to an edge on one side, and adapted to be held in the hand. So that the Cissbury find, although belonging to what is usually called the surface period, contains specimens affording every link of connection between the drift and the almond-shaped celt type. This discovery must, I think, be regarded as a step in knowledge of prehistoric antiquity, and a decided accession to the science of continuity, for Sir John Lubbock has told us in his preface to the work of Professor Nilsson, lately published,* that the Palæolithic, *i.e.*, the drift types, "have never yet been met with in association with the characteristics of a later epoch." I shall therefore be interested to know whether, after an examination of the Cissbury specimens, which I have presented to the Christy Collection, Sir John Lubbock may be induced to alter his opinion on that point; for I think it is entirely consistent with all that is known of early races of mankind, that early types should be retained in use long after the introduction of others that have been developed from them; however this may be, I think that in casting the eye from left to right along the upper row on the sheet (Plate xvii), it will puzzle the acutest observer to determine where the drift type ends and that of the celt begins. If it is contended, as I am aware it will be contended by some, that the typical characteristic of the celt consists in its being sharp at the broad end, while those of the drift are blunt at the broad end, I reply that many of the drift specimens are also sharpened at the broad end, more especially those represented in figures 9 and 10 from the drift of St. Acheul. Many specimens from Thetford which I have seen, as for example, Fig. 17 B, from a cast in the collection of the Society of Antiquaries, presented by Mr. Flower, approach

* "Nilsson on the Stone Age," edited by Sir John Lubbock. Editor's introduction, page 24.

equally closely to the celt type, as do some of those from the laterite beds of Madras, and though they are of rare occurrence in all these localities, and are certainly a variation from the normal type of drift implements, still they are found in sufficient numbers to serve as links in connecting the forms of the earliest, with those of the later period.

I have dwelt somewhat at length upon this part of my subject, owing to the circumstance of its presenting some features of novelty in the study of flint implements, and being therefore open to criticism on the part of those who are more favourable to the principles of classification than of continuity, with all the important concomitants of division, versus unity, which those principles involve.

I may now pass briefly over the remaining figures on the sheet. Figure 13 is a specimen found by Mr. Evans at Spienne, near Mons; its very close resemblance to figure 12 from Cissbury will be noticed, in fact the whole of the Spienne specimens resemble very closely those discovered in Cissbury, except that the Spienne implements of this class are associated with others of polished flint, which gives them a more advanced character than those derived from Cissbury, in which place only one fragment of a polished implement was discovered and that in a part of the intrenchment which renders it very doubtful whether it ought to be associated with the Cissbury find. Figures 15, 16, and 17 are from Denmark, Ireland, and Yorkshire;—this type, however, is rare in Denmark, most of the flint implements from that country being of a more advanced character, and having usually a rectangular cross section.

The lower row on the sheet consists of specimens derived, either from what has been termed the neolithic or polished stone age of Europe, or from savages who are still in a corresponding stage of progression in various parts of the world at the present time.

To the former or neolithic stone age of Europe belong figure 21 from France, figure 25 from the bed of the Clyde in Scotland, figure 27 from the Swiss lake dwellings, figure 29 from the caves in Gibraltar, figure 30 from Sweden, figure 36 from Portugal, figure 37 from the bed of the Thames, figure 38 from Ireland, figure 39 from Jelabonga, in Russia. Precisely identical forms are also found in Germany, Italy, and the Channel Isles. Amongst the specimens derived from the ancient stone age of other parts of the world, and belonging to an age of civilization that is now extinct, may be enumerated figure 22, from Peru, figure 40, from Mexico, figure 24, from Central India, figure 41, from Japan, figure 42, from Mugeyer, in Babylonia. Nearly similar ones, but flattened at the side, like those common in Denmark, have been obtained from China and Pegu. Figure 43 is from Algeria, from the collection of Mr. Flower.

The following are examples of the same class of implements, used by savages of our own, or of comparatively modern, times:—Figures 18 and 19 from Australia; these are generally used in a handle, formed by a withe twisted round them in the manner still used by blacksmiths in this country. Sometimes, however, I am informed by an eye-witness, the Australians use these celts in the hand without any handle at all. Although polished on the surface, these Australian

celts have been compared by Sir Charles Lyell to the oval forms of the drift represented in figure 7. The art of polishing appears to have preceded the development of form in this country. Figure 20, from New Zealand, is a specimen in Mr. Evans's collection, of which he has been so kind as to allow me to take an outline; this form, however, is extremely rare in New Zealand, the usual shape of the stone celts from that country being flat sided, like the specimens from Denmark, already noticed. Figure 23, is from the Pacific, figure 26, from Pennsylvania, these were used by the American Indians previously, and for some time after, the immigration of Europeans. Figures 31 and 32 are Carib celts from my collection, beautifully polished. Figure 33, from St. Domingo, is in the Cork Museum. Figure 34, from the Antilles, is in the Christy Collection; both of these have a human face engraved upon them. Figure 35 is of Jade, from New Caledonia, in my own collection.

Hafting.

The method of hafting these implements employed by savages, shows that they were used for a variety of purposes; in some, the edge is fastened at right angles to the handle, to be used as an adze, whilst in others the same tool is fastened with the blade in a line with the handle, to be used as a chopper or battle-axe. In some it is fastened with a withe, passed round the stone, as in the specimen from Australia (fig. 44 from this Institution) and some parts of North America; figure 45 is a stone axe from the Ojibbeway Indians, from my collection. At other times it is inserted in the side of a stick or club. A specimen in my collection from Ireland (fig. 46), one of the few that have ever been found with handles, shows that this was the method employed in that country.* Others are inserted in the end of a bent stick (fig. 47), a mode of hafting common in the Polynesian Islands, in Africa, Ancient Egypt, Mexico, North America, and New Caledonia; it is employed by the Kalmucks, and others, and was used during the bronze age. Some of the Australian axes were fastened to their handles by a peculiar preparation of gum manufactured for that purpose.

Dr. Klemm, in his "Werkzeuge und Waffen," supposes the first lessons in hafting to have been derived from nature, by observing the manner in which stones are often firmly grasped by the roots of trees growing round them, and he gives several woodcuts of specimens of Nature's hafting, which he has collected from various sources; one of these, extracted from his work, is represented in figure 48. I have placed upon the table, in illustration of this idea, an iron Mediæval axe-head (fig. 49), which has furnished itself with a handle in this manner, whilst buried beneath the surface; it is said to have been found in Glemham Park, Suffolk, eleven feet from the surface. Even to this day, when a peasant in Brittany discovers one of these stone celts upon the ground, he is in the habit of splitting the branch of a young tree and

* The handle, since its discovery, has been fractured in four places, and has shrunk a good deal from its original size.—A. L. F.

inserting the celt into the cleft; in the course of a year or two it becomes firmly fixed, and he then cuts off the branch, and uses the implement thus hafted by nature as a hammer for driving nails. In the "Antiquités Celtiques et Antidiluviennes," volume I, page 327, M. Boucher de Perthes mentions the discovery of two ancient stone hammer-heads, which appeared to have been furnished with handles by passing the hole over the bough of a tree and allowing it to fill up the aperture by its natural growth, until it became firmly fixed as a handle.*

It might be interesting, if space permitted, to follow up the development of the stone axe-head through its various phases until, in the latest stages, when bronze had already come into general use for weapons, we find it furnished with a hole through the middle for the insertion of the handle. It may, I think, be safely said, that although nature furnishes numerous examples in many classes of rocks, and especially in flints, of stones perforated with holes, and although they appear to have attracted the notice of the Aborigines of many countries by the peculiar superstitious reverence which is often found to be attached to such stones when found in the soil, that this mode of fastening stone implements in their handles did not come into use until late in the stone age, and that even in the bronze age it was but little employed.

Transition from Oval to Rectangular Forms.

Whether the stone celt having a square or rectangular section (such as are found principally in Denmark, New Zealand, Mexico, and Pegu), was coeval, or of subsequent development, to those of the almond-shape type, may be a matter for conjecture; the small flint hatchets found in the Kitchenmiddens of Denmark, appear to approach closely to the rectangular type. It is certain, that in the Swiss Lakes both forms are found fully developed, and it may be mentioned, as an instance of the constant tendency to variation that is everywhere observable in the weapons of the early races of mankind, that of the whole of the celts found at Nussdorf, in the Lake of Constance, though all might be traced to the same normal type as regards their general outline, no two were alike; and Dr. Kellar gives sections, showing every conceivable gradation from the square and rectangular, to the oval and circular section.† It may, however, be affirmed, that convex forms, as a general rule, preceded those having a rectangular or concave surface; it is so in the forms of nature, the habitations of animals are almost invariably convex. Dr. Livingstone mentions, that he found it impossible even to teach the natives of South Africa to build a square hut; when left to themselves for a few minutes, they invariably reverted to the circle. All the earliest habitations of pre-historic times are found to be circular or oval; even the sophisticated infant of modern civilization, when he plays with his bricks,

* Horæ Ferales.

† "The Lake Dwellings of Switzerland," by Dr. Ferdinand Kellar, page 108.

will invariably build them in a circular form, until otherwise instructed.

Development of Spear and Arrow-head Forms (Plate XVIII).

We must now turn to the development of the second great class of weapons—the spear and arrow. These may be classed together, the arrow being merely the diminutive of the spear, and it may be taken as a general rule, applicable to all the arts of pre-historic times, that when a given form has once been introduced, it will speedily be repeated in every possible size that can be applied to any of the various purposes for which such a form is capable of being used. Size, in the arts of the earliest ages, is no indication of progress. In the same way it may be said of the development of the animal or vegetable kingdom, size is no indication of improved organism.

In the same beds in which the drift-type implements are found, flakes, either struck off in the formation of such tools, or especially flaked off from a core in a particular manner, indicating that they were themselves intended for use as tools, are found in considerable numbers. No more useful tool could have been used during the stone age than the plain, untouched, flint flake, which, from the sharpness of the edge, is capable of being used for a variety of purposes. Those, for example, formed of obsidian are so sharp, that it is recorded by the Spanish historians, that the Mexicans were in the habit of shaving themselves with such flakes. As my present subject has to deal exclusively with war weapons, I will not enter into a detailed description of these flakes, further than to observe that they are found, together with the cores from which they were struck off, in every quarter of the globe in which flint, obsidian, or any other suitable material has been found, and that everywhere the process of flaking appears to have been the same.

Now, the fracture of flint is very uncertain; by constant habit, the ancient flint workers appear to have been able to command the fracture of the flint in a manner that cannot be imitated, even by the most skilful forgers of those implements in modern times; but, notwithstanding this, the varieties of the forms of the flakes thus struck off must have been very considerable, and these varieties must, from the very first, have suggested some of the different forms of tools that were made out of them.

I cannot, perhaps, explain this point better, than by exhibiting a number of flakes, found by myself in the bed of the Bann at Toom, in Ireland, at the spot where that river flows out of Lough Neagh. This was a place originally discovered by Mr. Evans, where probably, in a habitation, built upon the river, they formerly manufactured flint implements, and the bed of the river for a space of a hundred yards or more is covered with the flakes. It will be seen on examining these flakes, that some of them came off in a broad leaf-shaped form, and these with a very little additional chipping, have been formed into spear heads. Others longer and thicker have been chipped into something like picks, and others thinner and narrower than the two former, have been used

probably as knives, others for scraping skins. We see from this that certain forms would naturally suggest themselves through the natural fracture of the flint, and this may to a certain extent account, though it does not, I think, entirely account, for the remarkable resemblance of form and unity of development, observable in the spear and arrow heads, derived from localities so remote from each other, as almost to preclude the possibility of their having ever been derived from a common source.

I have arranged in tabular form, upon sheet No. 2 (Plate xviii), representations of spear and arrow heads from all the different localities from which I have been able to obtain them in sufficient number, to show fairly the numerous varieties which each country produces. On the top of the sheet, from left to right, the several forms are arranged in the order that appears most truly to indicate progression; but it must not be supposed that this arrangement is absolutely correct, for the several forms, such for example as the tang and the triangular form, were most probably derived from a common centre. The specimens from each locality ought therefore, in order to display their progression properly, to be arranged in the form of a tree, branching from a common stem. On the left of the sheet are written the different periods, and localities from which the specimens are derived. Commencing with the drift, the oldest of which we have any knowledge, and which are coeval with the elephant and rhinoceros in Europe, we have the peculiar thick form already described. The examples of the drift period here shown, from their small size, must evidently have been used with a shaft, as they are scarcely large enough to have served as hand tools. None of the lozenge, tang, or triangular forms, have ever been found in the drift.

The next line represents specimens from the French caves of the reindeer period, which are taken from the "Reliquiæ Aquitanicæ," chiefly from Dordogne. It will be seen that in these caves, the first rude indications of the lozenge and tang form are represented, but no perfect specimens of either class. No example of the triangular form has been discovered. The leaf-shape form, however, is well represented.

In the ancient habitations of the Swiss Lakes, which belong to a later period, all varieties, except those of the drift type, are represented, but none of them in their most fully developed form; the tangs it will be seen are long, and the barbs comparatively short; the triangular form, which I consider to be the latest in the order of development, is mentioned by Dr. Kellar, from whose work these specimens are taken, as being extremely rare. The comparative rarity of flint implements in the Lakes, may however, in some measure be accounted for, by the absence of flint in the district, necessitating the importation of this material from a distance.

The specimens from Yorkshire, Ireland, Sweden, Denmark, Italy, and Germany, may be considered to carry the development of these forms up to the latest period, viz., the late stone, and early bronze age; for there can be no doubt from the number of arrow heads found in these countries, in connection with implements of bronze, that they

were used for missile purposes long after the "*armes blanches*" had been constructed of metal.

In all these localities, it will be seen that the various gradations of form are identical; but as I have been able to collect a much larger number of arrow heads from Ireland than elsewhere, the development of form is more apparent in the specimens selected from that country.

From the leaf shape, it will be observed, there is every link of transition into the perfect lozenge type, and the latter are as a general rule, both in Ireland and in Yorkshire, much rarer, and more carefully constructed, than the leaf-shaped type, showing that there is every probability of the lozenge having been an improved form.

The tang-form is represented, at first, by a few rude chips on each side of the base of the original flake, narrowing that part in such a manner, as to admit of its being inserted into a handle or shaft, and bound round with a sinew. This is superseded by the gradual formation of barbs on each side, and these barbs are lengthened by degrees, until they reach to the line of the base of the tang; the tang subsequently shortens leaving the barbs with a semicircular aperture between them, and thus approaching some of the forms represented in the triangular column. These latter barbed specimens are usually more finished, and chipped with greater care than the long tanged ones, which are rougher, more time-worn, and probably of earlier date.

The triangular form is seen at first, with a straight base; gradually a semicircular aperture appears, and this deepens by degrees until, in some of the more carefully formed specimens, it approached the form of a Norman arch. This last variety is especially well represented in Denmark.

Sir William Wild's arrangement, in his Catalogue of the Royal Irish Academy, differs in some respects from this; he considers the triangular an early form, and he assigns the final perfection of the art of fabricating flint spear heads, to the large lozenge-shape form, grounding his opinion on the circumstance of many of this form, of the larger size, having been found polished, whilst those of the leaf, triangular, and tang shape, are not usually carried further than the preliminary process of chipping. But it is evident that these larger forms may have been used for spears, the lozenge-shape being especially adapted for this purpose, as enabling the owner of it to withdraw it from the wound, after slaying his adversary; while those of the barbed and triangular form being lighter, and calculated to stick in the wound, would be better adapted for arrow heads—and it is unlikely that the same amount of labour would be expended on a weapon, intended to be cast from a bow, as upon one designed to be held in the hand. I consider the polishing of these particular weapons therefore to be no criterion of age, but merely to indicate that they were used as "*armes d'hast*," and not as missiles.

It appears highly probable, however, that all the several varieties, if not developed simultaneously, were used at the same time, for we find amongst the Persians, the Esquimaux, and many other nations,

that a great variety of arrow-heads are carried in the same quiver, and are used either indiscriminately, or for different purposes.*

In the eighth row from the top, I have arranged a series of similar forms from America, obtained chiefly from Pennsylvania, but they are also found in other parts of the Continent, and some few of the illustrations here given, viz., figures 131, 132, and 133 (Pl. xviii), are from Tierra del Fuego. Their forms enable them to be arranged under precisely the same divisions, as those from the continent of Europe, and in each division the same development is observable. The tang or barbed form, however, differs sufficiently from the European forms of the same class, to show that they arose independently, and were not derived from a common source. The tang of the American arrow heads, it will be seen, is broader, at least in the later forms, and it appears to have originated in a notch on the sides of the blade, intended to hold the sinew with which it is attached to the shaft or handle. This notch appears to have been constructed lower and lower on the sides of the blade, until at last it comes down quite into the base of the flint, and it then closely resembles the European in form; compare for example figures 94 and 136, Plate xviii; except that the tang is broader, and has a lateral proportion on each side, so as to render it firmer in the shaft when bound by the sinew.

Notches at the side of the blade are extremely rare in Ireland, but from Sweden, Professor Nilsson gives a drawing of an arrow-head, which I have copied on to the sheet, see Fig. 96 (pl. xviii). It is precisely identical, in its peculiar form, to one here figured from America Fig. 139 (pl. xviii), and they both have a concave base, in addition to the side notch; thus apparently representing a transition form between the tang and the triangular, which I have never noticed, except in the two specimens here referred to, and which must be regarded in Europe as extremely rare.

To illustrate the mode of fixing these instruments in their shafts, I have here figured several examples from my collection, two of these Figs. 163 and 164 (pl. xviii), were derived from the Esquimaux, between Icy Cape and Point Barrow, the person from whom I purchased them having brought them himself from that locality. Figures 165, 166, and 167 (pl. xviii), are from California.

Burton says that the Indians between the Mississippi and the Pacific use the barbed form only for war; and Schoolcraft, in the "Archives of the Aborigines of America," gives illustrations of two methods of fastening, one for war and the other for the chase, the former being loosely tied on, so as to come off when inserted in the wound.

But, in addition to their use as arrow points, we have reason to suppose that they were used also as knives. I have represented on this sheet Figs. 168 and 169 (pl. xviii), two short-handled instruments from Peru, which are now in the British Museum, into which similar arrow

* After having witnessed the process of fabricating flint arrow heads, as re-discovered by Mr. Evans, I am able to understand why it is that the leaf-shaped form is of more frequent occurrence, and why this and the long-tanged forms are so often rougher and less finished than the other forms, the deep barbs and hollow base requiring much greater skill than the former.—A. L. F.

points are inserted. These, from the shortness and peculiar shape of their shafts, could hardly have been used as darts. The only weapon peculiar to those regions from which such an instrument could have been projected, is the blow-pipe, and they are entirely different from the darts used with the blow-pipe, either in South America, the Malay Peninsula, or Ceylon, in which countries the blow-pipe is used. There is reason to believe, from the manner in which they are placed in the graves unaccompanied by any bow or other weapon from which they could have been projected,* that they were employed as knives, and this is confirmed by the fact already mentioned of the inhabitants of Tierra del Fuego using their arrow points for knives. The great numbers in which they are found in Ireland, in Yorkshire, and other localities appertaining to the late stone age, in which places they form the greater part of the relics collected, and are always the most highly finished implements discovered; the other stone implements associated with them being either celts, flint-discs, picks, or rough or partially worked flakes, that are capable of being wrought into arrows, the fact that the peculiar modification of form observable at the base of these implements appears to have been designed rather to facilitate the attachment of them to their wooden shafts or handles, than for the special purposes of war; and the frequent marks of use, as if by rubbing, that are found on the points of many of them, especially in the specimens from Ireland; all these circumstances favour the supposition that in Europe, as well as in America, these arrow-head forms were used for many other purposes besides war and the chase; and that, like the assegai of the Caffre, and the many other examples of tool weapons already enumerated, we may regard them as having served to our primeval ancestors the general purposes of a small tool available for carving, cutting, and for all those works for which a fine edge and point was required. On the other hand the celt undoubtedly provided them with a large tool capable of being applied to all the rougher purposes, whether peaceful or warlike, for which it was adapted in the simple arts of an uncivilized people.

In the ninth row I have arranged, under their respective classes, the whole of the specimens of flint arrow heads that are given in Siebold's atlas of Japanese weapons.† It will be seen that they present the same variety of form as those already described. A similar collection of flint arrow heads has lately been added to the British Museum, by Mr. Franks and described by him. They formed part of a Japanese collection of curiosities, and are labelled in the Japanese character, showing that this remote country not only passed through the same stone period as ourselves, but that, as their culture improved and expanded, they, like ourselves, have at last begun to make collections of objects to illustrate the arts of remote antiquity.

* In the museum belonging to the Cork College, there is a Peruvian mummy, with which, amongst other articles, two of these arrow-pointed knives were found.—A. L. F.

† Siebold, Nippon, Alte Waffen.—Tab. xi.

Implements composed of Perishable Materials.

It is now time that I should say a few words respecting weapons constructed of more perishable materials; for it is not to be assumed that, because we find nothing in the drift-gravels but weapons of flint and stone, the aborigines of that age did not also employ wood and other materials capable of being more easily worked. If man was at that time, as he is now, a beast of prey, he must also have become familiar in the very first stages of his existence, with the uses of bone as a material for fabricating into weapons. In the French caves, a large number of bone implements have been found, and their resemblance, amounting almost to identity, with those found in Sweden, amongst the Esquimaux, and the inhabitants of Tierra del Fuego, has been noticed by Sir John Lubbock, Professor Nilsson, and others.

But, in dealing with the subject of continuity and development, it is necessary to confine our remarks to those countries from which we have had an opportunity of collecting large varieties of the same class of implement; we must therefore have recourse to the Australian, the New Zealander, and those nations with which we are more frequently brought in contact.

Transition from Celt to Paddle, Spear, and Sword Forms (Plate XIX).

The almond-shape celt form, as I have already demonstrated, is one so universally distributed and of such very early origin, that we may naturally expect to find many of the more complicated forms of savage implements derived from it. In a paper in the "Ulster Journal of Archæology," for 1857, a writer draws attention to the occurrence in the bed of the Bann, and elsewhere in the north of Ireland, of stone clubs, formed much upon the general outline of the celt, but narrowed at the small end, so as to facilitate their being held in the hand like a bludgeon. Fig. 50 is copied from the illustration given in the paper referred to, and fig. 51 is another in my collection, also from Ireland, of precisely the same form; the original is upon the table, and it will be seen that it is simply a celt cut at the small end, so as to adapt it to being held in the hand. Fig. 52 is an implement in common use among the New Zealanders, called the pattoo pattoo, of precisely the same shape; it is of jade, and its form, as it may be seen by the thin sharp edge at the top, is evidently derived from that of the stone celt. Fig. 53 is a remarkably fine specimen, from the museum of this Institution; the handle part in this specimen is more elaborately finished. These weapons are used as clubs to break heads, and also as missiles, and the fact of their having been derived from the celt is shown by the manner in which they are used by the New Zealanders. I am informed by Mr. Dilke, who derived his information from the natives whilst travelling in New Zealand, that the manner of striking with these weapons is not usually with the side, but with the sharp end of the pattoo pattoo, precisely in the same manner that a celt would be used if held in the hand. The spot selected for the blow is usually above the

ear, where the skull is weakest. If any further evidence were wanting to prove the derivation of this weapon from the stone celt, it is afforded by fig. 54, which is a jade implement lately added to the British Museum, from the Woodhouse Collection. It was, for some time, believed to have been found in a Greek tomb, but this is now believed by Mr. Franks to be a mistake; it is, without doubt, a New Zealand instrument. The straight edge shows unmistakably that the end was the part employed in using it, while the rounded small end with a hole at the extremity, shows that, like the pattoo pattoo, it was held in the hand. It is, in fact, precisely identical with the hand celts from Ireland, above described, and forms a valuable connecting link between the celt and pattoo pattoo form. Now it may be regarded as a law of development, applicable alike to all the implements of savage and early races, that when any form has been produced symetrically, like this pattoo pattoo, the same form will be found either curved to one side, or divided in half (the variation, no doubt, depending on the purposes for which it is used). The pattoo pattoo, having been used at first, like its prototype the celt, for striking with the end, would naturally come to be employed for striking upon the side edge.* The other side would therefore be liable to variation, according to the fancy of the workman. Figs. 55, 56, and 57, are examples of these implements, in which the edge is retained only on one side, and at the end, the other side being variously cut and ornamented. This weapon extended to the west coast of America, and there, as in New Zealand, they are found both of the symmetrical and of the one-sided form. Fig. 58 is one believed to be from Nootka Sound, in my collection. Fig. 59 is also from Nootka, in the museum of this Institution. Fig. 60 is an outline of one from Peru, which is figured in Dr. Klemm's work, and I am informed that a nearly similar club has been derived from Brazil.

The same form as the pattoo pattoo, in Australia has been developed in wood. Fig. 61 is from Nicol Bay, North West Australia, and is in the Christy Collection described as a sword. Fig. 62 is of the same form, also of wood, but of cognate form, from New Guinea. In fig. 63, which is also from New Guinea, we see the same form developed into a paddle. In the larger implements of this class we see the same form, modified in such a manner as to diminish the weight; thus, the convex sides become either straight or concave. I have arranged upon the walls a variety of clubs and paddles, from the Polynesian Islands, figs. 64 to 67, all of which must have been derived from a common source. The New Zealand steering paddle, fig. 64, it will be seen, is simply an elongated celt form. Those from the Marquesas (fig. 65), Society Isles, Fiji, and Solomon Isle, &c., are all allied. In the infancy of the art of navigation, we may suppose that the implements of war, when constructed of wood, may have frequently been used as paddles, or those employed for paddles have been used in the fight, and this may perhaps account for the circumstance that, throughout these regions, the

* Evidence of this transition may be seen by examining any number of pattoo pattoos. Some are sharp at the end, others are blunt at the end, but sharp at the side near the broadest part.—A.L.F.

club, sword, and paddle pass into each other by imperceptible gradations. In the Friendly Isles we may notice a still further development of this form into the long wooden spear, specimens of which, from this Institution, are exhibited (figs. 68, 69, and 70).

We must not expect to find all the connecting links in one country or island. We know that the same race has at different times spread over a very wide area; that the Polynesians, New Zealanders, and Malays are all of the same stock, speaking the same or cognate languages. The same race spread to the shores of America on the one side, and to Madagascar on the other, carrying with them their arts and implements, and we may, therefore, naturally expect that the links which are missing in one locality, may be supplied in another.

Development of the Australian Boomerang (Plate XX).

We now turn to the Australians, a race which, being in the lowest stage of cultivation of any with whom we are acquainted, must be regarded as the best representatives of the aboriginal man.

I have transferred the Australian sword, figured in Plate xix, fig. 61, to Plate xx, fig. 72, in order that from it we may be able to trace the development of a weapon supposed by some to be peculiar to this country, but one which in reality has had a very wide range in the earliest stages of culture—I allude to the boomerang.*

The Australians in the manufacture of all their weapons, follow the natural grain of the wood, and this leads them into the adoption of every conceivable curve. The straight sword would by this means at once assume the form of the boomerang, which it will be seen by the diagram is constructed of every shade of curve from the straight line to the right angle, the curve invariably following the natural grain of the wood, that is to say, the bend of the piece of a stem or branch out of which the implement was fabricated.

All savage nations are in the habit of throwing their weapons at the enemy. The desire to strike an enemy at a distance, without exposing one's self within the range of his weapons, is one deeply seated in human nature, and requires neither explanation nor comment. Even

* Since this paper was read to the Institution, Sir John Lubbock has delivered a remarkably interesting series of lectures on savages at the Royal Institution; in the course of which he took exception to my classification of the Indian, African, and Australian boomerangs, under the same head; giving as his reason, that the Australian boomerang has a return flight, whilst those of other nations have not that peculiarity. If it could be shown that the Australian weapon had been *contrived* for the purpose of obtaining a return flight, I should then agree with him in regarding the difference as generic. But the course of my investigations tends to show that this was probably an application of the weapon accidentally hit upon by the Australians, and that it arose from a modification of weight and form, so trivial, as to prevent our regarding it as generically distinct from the others. I therefore consider the Australian weapon to be a mere variety of the implement which is common to the three continents. The difference between us on this point, though one of terms, is nevertheless important as a question of continuity. I am much gratified, however, to find my opinions on many other points, supported by Sir John's high authority.—A.L.F.

apes, as I have already noticed, are in the habit of throwing stones. The North American Indian throws his tomahawk; the Indians of the Gran Chako, in South America, throw the "macana," a kind of club. We learn from the travels of Mr. Blount,* in the Levant in 1634, that at that time the Turks used the mace for throwing, as well as for striking. The Kaffirs throw the knob kerry, as did also the Fidasians of Western Africa.† The Fiji Islanders are in the habit of throwing a precisely similar club. The Franks are supposed to have thrown the francisca.‡ The New Zealander throws his pattoo pattoo, and the Australian throws the "dowak" and the waddy, as well as his boomerang. All these weapons spin of their own accord when thrown from the hand. In practising with the boomerang, it will be found that it does not require that any special movement of rotation should be imparted to it, but if thrown with the point first it must inevitably rotate in its flight. The effect of this rotation, it will hardly be necessary to remind those acquainted with the laws of projectiles, is to preserve the axis and plane of rotation parallel to itself, upon the principle of the gyroscope. By this means the thin edge of the weapon would be constantly opposed to the atmosphere in front, whilst the flat sides, if thrown horizontally, would meet the air opposed to it by the action of gravitation; the effect, of course, would be to increase the range of the projectile by facilitating its forward movement, and impeding its fall to the earth. This much, all curved weapons of the boomerang form possess as a common property.

If any large collection of boomerangs from Australia are examined, it will be seen that they vary not only in their curvature, but also in their section; some are much thicker than others, some are of the same breadth throughout, whilst others bulge in the centre; some are heavier than others, some have an additional curve so as to approach the form of an S, some have a slight twist laterally, some have an equal section on both sides, while others are nearly flat on one side and convex on the other.

As all these varieties continued to be employed, it would soon be perceived that peculiar advantages were derived from the use of the flatter class of weapon, especially such as are flat on the under side, for by throwing these in such a manner as to catch the air on the flat side, instead of falling to the ground, they would rise in the air, precisely in the same manner that a kite (fig. 71), when the boy runs forward with the string, rises and continues to rise as long as it is kept up by the action of the air beneath. In like manner the boomerang, as long as the forward movement imparted to it by the thrower continues, will continue to rise, and the plane of rotation, instead of continuing perfectly parallel to its original position, will be slightly raised by the action of the atmosphere on the forward side. When the movement of transition ceases, the boomerang will begin to fall, and its course in falling will be by the line of least resistance, which is in the direction of the edge that lies obliquely towards the thrower; it

* "Voyage into the Levant," by Henry Blount, Esq., 1634.
† Basman's Guinea. ‡ Horæ Ferales.

will therefore fall back in the same manner that a kite, when the string is suddenly broken, is seen to fall back for a short distance, but as the kite has received no movement of rotation to cause it to continue in the same plane of descent, it soon loses its parallelism, and falls in a series of fantastic curves towards the ground. The boomerang will do the same thing if it loses its movement of rotation, but as long as this continues, which it usually does after the forward movement has ceased, it continues to fall back upon the same inclined plane by which it ascended, and finally reaches the ground at the feet of the thrower. There are various ways of throwing the boomerang, but the principles here enunciated will explain the course of its flight in whatever manner it may be thrown.

Now it is evident that this peculiar mode of flight would be of great advantage to the savage, for as we learn from a paper in the Transactions of the Ethnological Society by Mr. Oldfield, who speaks from experience, the natives usually employ this weapon against large flocks of ducks or wild fowl in rivers or marshes; the weapon after striking or missing the prey would return to the thrower, instead of being lost in the morass; its use, therefore, would give to the individual or tribe possessing it, a great advantage over their neighbours in the struggle for life.

But it is evident that the principles of the flight of the boomerang, such as I have described it, according to the recognized law of projectiles, must have been entirely unknown to the savage; he can no more be said to have *invented* the boomerang than he can be said to have *invented* the art of sustaining life by nourishment. Instinct prompts him to eat, little better than instinct would enable him to select from amongst his weapons such as are found most suitable for obtaining food, and we have already seen how he may have been led to the adoption of such an instrument as the boomerang, purely through the laws of accidental variation, guided by the natural grain of the material in which he worked.

The boomerang, though used chiefly for game, is used also as a weapon, and Mr. Oldfield says that it is capable of inflicting a wound several inches in depth.

A further improvement is effected in the flight of the boomerang by giving the arms a slight lateral twist, by means of which it is caused to rise by virtue of its rotation, screwing itself up in the air precisely in the same manner that a boy's flying top rises to the ceiling. By means of this addition, the weapon is sometimes made to strike an object in its fall to the ground, behind the thrower, but the twist is not by any means invariable, as any one may see by examining a collection of these weapons. Nor is it essential to ensure a return fall, which I have frequently ascertained by practising with a boomerang that was perfectly flat.

On examining the diagram on sheet 4 (Plate xx), it will be seen that the boomerang passes by imperceptible gradations from the straight sword, fig. 72, on the one hand, into the "malga" or kind of pick, fig. 89, used for war purposes on the other,* and this Australian malga closely resembles a

* This weapon is called "leowel" by the Australians now in this country.—A. L. F.

weapon of the same kind from New Caledonia, figs. 90 and 91, which, as already mentioned, is used both as a weapon and for tilling the ground. Upon sheet No. 5 (see Plate xx), figs. 92 to 100, I have also arranged the links of connection between the boomerang and a kind of hatchet or chopper called the waddy. A slight swell or projection is seen to grow out of one end of the concave side of the boomerang, and this developes into the form of a chopper. In those specimens of this class, in which the projection is only slightly developed, as in figs. 94 and 95, the sides of the implement are flat, and the weapon is obviously designed for throwing, but in some of those in which the projection is more fully developed, as in fig. 96, the shaft is quite round, and the head becomes thick and heavy, so as to render it totally unsuited to the purposes of a missile. We see, therefore, in these diagrams the transition, by minute gradations, from a missile to a hand weapon, or *vice versâ*. The boomerang, the sword, the malga, and the waddy, are thus seen to be allied in such a manner as to make it difficult to determine which of the four was the original weapon, and, if properly arranged to display their development, they should be distributed in branch lines, starting from a common centre, exactly in the same manner that I have suggested the various forms of spear and arrow heads ought to be arranged in the natural order of progression.

Indian Boomerangs (Plate XX).

On sheet No. 6 (Plate xx), figs. 101 to 105, I have arranged a series of boomerangs from India. Figures 101 and 102 are specimens of the "katureea" or boomerang of Goojerat, from the India Museum; they are used by the koolees, according to the ticket in the Museum, "for whirling at hares, boars, and other wild animals, and disabling them." It is of raen wood, thicker and heavier than the Australian specimens, and therefore not adapted to rise in the air and return. The section is equal on both sides, but in other respects it is precisely identical with the Australian weapon, and appears to have been roughly chipped into form. Figures 103 and 104 are of an improved form, from Madras, called the collery, also of wood, but having a knob at the handle end; they are from the Museum of this Institution. Figure 105 is precisely the same form in steel, from the India Museum. It is probable that this weapon led to the use of the steel "ckakkra" or war quoit (fig. 106) of which I have given an illustration from the Museum of this Institution. The principle of its flight is precisely that of the boomerang, in so far as regards the increase of range and velocity produced by the rotation preserving the thin edge in the line of its forward motion. The earliest mention of this instrument is in the description of the Malabar Coast, by Magellan, about 1512, translated by Mr. Stanley, for the Hakluyt Society. The author describes amongst the arms used in the kingdom of Dely, certain wheels called chacarani, "two "fingers broad, sharp outside like knives, and without edge inside, "and the surface of these is of the size of a small plate, and they "carry seven or eight of these each, put on the left arm, and they

" take one and put it on the finger of the right hand, and make it spin " round many times, so that they hurl it at their enemies, and if they " hit any one on the arm or neck, it cuts through all, and with these " they carry on much fighting, and are very dexterous."* These weapons are usually worn on the head, but the circumstance here mentioned of their being worn on the arm, reminds us very much of the peculiar weapon worn by the Djibba negroes of Central Africa as a bracelet; this is represented in figure 107; it is of iron, sharp on the outside and blunt on the inside, which touches the arm; the edge is usually covered with a strip of hide to prevent injury to the person. I am not aware that this weapon of the negroes is ever used as a missile, but the occurrence of two such singular weapons, similarly carried, is worthy of notice, more particularly as we have clear evidence of a connection between the metal workers of the whole continent of Africa and the hill tribes of Central India.

It is possible that many links of connection may be supplied when the subject of continuity comes to be more carefully studied in these countries. It would appear extremely probable that the small Koorkeree and Goorkah knife, though now used only for hand fight, may have had their origin in these missile weapons, which they resemble in form, especially the large Goorkah knife. It would be interesting to know if they are ever thrown. I have heard stories of this having been the case, but no authentic account of such a practice. The Spaniards throw their long clasp knives with effect for a considerable distance.

African Boomerangs (Plate XX).

Turning to Africa (Plate xx), we find the boomerang well represented in many parts of that continent. Figure 108 is an ancient Egyptian boomerang of wood, in the British Museum. It was obtained from the collection of James Burton Junior, Esq., which was formed by him in Egypt, and is described as " an instrument for fowl- " ing, for throwing at, or knocking down birds, as is continually repre- " sented on the walls of the tombs." It is of hard but light wood, the section is symmetrical on both sides, and not flat on one side, like some of the Australian boomerangs; it is somewhat broader at the ends than in the middle of the blade. Figures 109, 110, and 111, are taken from Rosellini's Egyptian Monuments, and show how this instrument was used by the ancient Egyptians. Sir Samuel Baker has described the weapon called the " trombash," used in those parts of Abyssinia which he traversed.† It is of hard wood, resembling the Australian boomerang, about two feet in length, and the end turns sharply at an angle of 30°; they throw this with great dexterity, and inflict severe wounds with the hard and sharp edge, but, unlike the boomerang, it does not return to the thrower. Figure 113 is a wooden instrument, in the Christy Collection, said to be used by the Djibba

* Coasts of East Africa and Malabar, by Magellan, translated for the Hakluyt Society by the Honorable H. Stanley, p. 101.

† Nile Tributaries of Abyssinia, Baker, p. 511.

negroes for throwing at birds. Figure 114 is the Nubian sword, which in form exactly resembles the boomerang. They have a great variety of curves, some of them, especially those of the same form used in Abyssinia, bending nearly in a right angle. I am not aware that this instrument is ever thrown by the Nubians; they, however, are in the habit of throwing their curved clubs with great dexterity. Figure 115 is an iron implement of native workmanship, used as a missile by the inhabitants of Central Africa; it was brought from that region by Consul Petherick, at whose sale I purchased it. Like the majority of the succeeding figures represented on this sheet, it resembles the Australian boomerang, in being flat on the under side, that is to say, upon the side which would be undermost, if thrown from the right hand with the point first; the weight, however, would prevent such a weapon from rising in the air, or returning to the thrower. Figure 116 is used by the Mundo tribe of Africa; like the last, it is flat on the under side; in form it resembles the falchion, represented in the Egyptian sculptures as being held in the hand by Rameses and other figures, when slaying their enemies. The small knob on one side of the blade is used to attach it to the person in carrying it. Figure 117, from Central Africa, is clearly a development of the preceding figure. Figure 118 is a weapon of the same class, from Kordofan, obtained near the cataracts of Essoan, Upper Nile, and now in the Museum of this Institution; though of the same character as the other missiles, its section is equal on both sides, and therefore it is not calculated to range far in its flight. Figure 119 is also from the Museum of this Institution, it is flat on the under side. Figures 120 and 121 are from illustrations in Denham and Clapperton's Travels in Northern and Central Africa, of the missile instruments, called "hunga-mungas," used by the negro tribes, south of Lake Tchad. One of these is of very peculiar form; in the course of the innumerable variations which this weapon appears to have undergone, the constructor appears to have hit upon the idea of representing the head and neck of a stork. Figure 122 is from a sketch in Dr. Barth's Travels, of one of these weapons, belonging to the Marghi, a negro tribe in the same region; it is called "danisco," and he says that the specimen here represented is of particularly regular shape, thereby inferring that numerous varieties of form are in use among these people. In another place, he describes the "goliyo" of the Musqu and the "njiga" of the Bagirmi, as weapons of the same class, the name of the latter differing from the word for spear, only in a single letter; he says this weapon is common to all the pagan, *i.e.*, negro tribes that he came across*. Figure 123 is from East Central Africa, presented to the Christy Collection by the Viceroy of Egypt; it is described as a cutting instrument, from the country of the Dinkas and Chouloukes, capable of being thrown to a great distance. Mr. Petherick met with these tribes in his travels on the White Nile. Figure 124 from my collection, is described as a battle-axe of the Dor tribe, between the equator and the 6th or 7th degree of north latitude. It

* Barth's Travels in Africa, vol. iii, pages 231, 451, &c., &c.

was brought to England by Mr. Petherick, who obtained it in his travels in 1858; it is used also for throwing. Figure 125 is from an illustration in Du Challu's work, of the missile tomahawk, used by the Fans in the Gaboon, in West Central Africa; he says that the thrower aims at the head, and, after killing his victim, uses the round edge of the axe to cut off the head. We see from this, that notwithstanding the innumerable and apparently meaningless variations which this weapon has undergone, the different parts of it are sometimes applied to especial uses. Figure 126 is another missile, used by the Neam Nam tribes, East Central Africa. Mr. Petherick says, that the Baer tribe carry a different kind of iron missile from the Neam Nams. Figures 126 to 129, are different varieties of Neam Nam weapons, in which, as they are all derived from the same people, the gradual transition of form is more perceptible than in those isolated specimens derived from different tribes. If, however, we had specimens of all the varieties used by each tribe, we should without doubt be able to trace the progression of the whole of them from a common form. As it is, the connection is sufficiently obvious when the details are examined, throughout the whole region in which they are found, extending from Egypt and the Nile in the East, to the Gaboon on the West Coast. In all, the principle of construction is the same, the divergent lateral blades serving the purpose of wings, like the arms of the Australian boomerang, to sustain the weapon in the air when spun horizontally. The variations are such as might have resulted from successive copies, little or no improvement being perceivable in the principle of construction throughout this region notwithstanding the innumerable forms through which it must have passed during its transmission from its original source, the locality of which we shall probably be unable to determine, until the antiquities of the country have been more carefully described and studied. As, however, it is everywhere found in the hands of the negro aborigines of the country, it must probably have had the same origin as the arts of smelting and fabricating iron, which is everywhere identical throughout this region, and is, without doubt, of the remotest antiquity, dating long prior to any historical record of the continent of Africa.

Cateia.

The possible employment of the boomerang in Europe has been made the subject of occasional speculation amongst antiquarian writers. Having been used in Egypt, and perhaps in Assyria, there is no good reason for doubting that it may have spread from thence to the north west. In a learned paper on the subject, by Mr. Samuel Ferguson, in the 19th volume of the Transactions of the Royal Irish Academy, the author endeavours to prove that the cateia mentioned by classical authors was the boomerang. He quotes several passages, and amongst them one from the Æneid of Virgil, in which mention is made of a people accustomed to whirl the cateia, after the Teutonic manner. In the Punics of Silius, one of the Lybian tribes who accompanied Hannibal to Italy, is described as being armed with a bent or crooked

cateia. Isidore, bishop of Seville, a writer of the end of the sixth and beginning of the seventh century described the cateia as "a species "of bat, which, when thrown, flies not far, by reason of its weight, "but where it strikes, it breaks through with extreme impetus, and if "it be thrown with a skilful hand, it returns back again to him who "dismissed it."

Strabo also describes the Belgæ of his time, as using "a wooden "weapon of the shape of a grosphus, which they throw out of hand, "and which flies faster than an arrow, and is chiefly used in the pursuit "of game."

General Conclusions relative to the Boomerang.

Those who desire further information relative to its supposed use in Europe, cannot do better than refer to the paper from which I have quoted. Meanwhile, enough has been said to show:—1stly, that the boomerang was used in many different countries at a very early period, and in a very primitive condition of culture, and that it was everywhere employed chiefly in the pursuit of game; 2ndly, that it was everywhere constructed of wood, before it was copied in metal; 3rdly, that in Australia it originated as a variety of the almond or leaf-shaped sword, and was suggested by the natural curvature of the material out of which it was formed; 4thly, that the subsequent improvements by which its return flight was insured, arose from a practical selection of suitable varieties, and was not the result of design, and,—5thly, that the form of the boomerang passes by minute gradations, into at least three other classes of weapons in common use by the same people, and may therefore be regarded as a branch variety of an original normal type of implement, used by the most primitive races as a general tool or weapon.

Development of the Club (Plate XXI).

Amongst other implements used for war, the form of which appears to be derived from the same common source as those already described, may be included the Australian club, and the wamera or throwing stick. I have arranged upon sheet, No. 8 (Plate xxi), figs. 130 to 137, a series of Australian clubs, showing a transition from the plain stick of equal size throughout, to one having a nearly round knob at one end. Nearly similar forms to some of these, from Africa, figs. 138 to 140, are also represented on the same sheet.

Contrivances for Throwing the Spear (Plate XXI).

Amongst the Australian wameras, there are so many varieties, that it is next to impossible to speculate upon the priority of any particular form, unless the plain stick, with a projecting peg at one end, may be regarded as, certainly the simplest, and therefore the earlier form. The wamera is held in the right hand, and the projecting peg at the end is fitted into a cavity at the end of the spear, which latter is held

in the left hand, in the required direction, until just before the moment of throwing. The spear is then impelled to its destination by the wamera, which gives great additional impetus to the arm. Fig. 147 is a wamera from Nicol Bay, of exactly the same general outline, as the sword already figured, from that locality, figs. 61 and 62 (Plate xix), except that one of the faces at the end of which the peg is fastened, is concave, and the other convex; this specimen is in the Christy Collection. The wamera assumes a great variety of forms, some, as for example, fig. 142, resemble on a small scale the New Zealand paddle, the broad end being held in the hand, and the peg inserted in the small end; others broad and flat, figs. 148 to 150, bulge out in the middle by successive gradations, until they approach the form of a shield. No reasonable cause that I am aware of, can be assigned for these different forms, beyond caprice, and the action of the law of incessant variation, which is constant in its operation amongst all the works of the aborigines.

The wamera is found on the north-west* and south-west† coasts of Australia, and Major Mitchell describes it, in the east and central parts of the Continent.‡

That the wamera preceded the bow, appears probable from the fact that no bow is ever used in Australia, unless occasionally upon the north coast, where it is derived from the Papuans. The bow is not indigenous in New Zealand, or in any of those islands of the Pacific, which are peopled by the Polynesian race, it belongs truly to the Papuans, and where it is used elsewhere in the Pacific Islands as a toy, it may very probably have been derived from their Papuan neighbours. The throwing sticks are used in New Zealand, in which country Mr. Darwin describes the practice with them. "A cap," he says, "being fixed at "30 yards distance, they transfixed it with the spear delivered by "the throwing stick with the rapidity of an arrow from the bow of a "practised archer."§ In New Guinea, Captain Cook saw the lance thrown 60 yards, as he believed, by the throwing stick. I saw the Australians, now exhibiting on Kennington common, throw their spears with the wamera nearly 100 yards extreme range, but as they practised only for range, I had no opportunity of observing the accuracy of flight. Mr. Oldfield says that their practice has been much exaggerated by the European settlers, in order to justify acts on their part, which would otherwise appear cowardly. He says, that a melon having been put up at a distance of 30 yards, many natives practised at it for an hour without hitting it, after which an European, who had accustomed himself to the use of this weapon, struck it five times out of six with his spear. Klemm, on the other hand, has collected several accounts of their dexterity in the use of it; he says, that the range is

* Gregory's Account of his Expedition in 1861, vol. xxxii, Royal Geographical Society's Journal.

† A. Oldfield, Esq., on "Aborigines of Australia." Transactions Ethno. Soc., vol. iii.

‡ "Expedition to the Interior of Eastern Australia," by Major T. L. Mitchell, Surveyor-General, Geographical Society's Journal, vol. ii.

§ Darwin, Naturalist's Journal.

90 yards, and mentions that Captain Phillips received a wound several inches deep at 30 paces. At 40 paces he says, the aborigines are always safe of their mark. A sharp flint is usually fixed with gum into the handle of the wamera, which they use for sharpening the points of their spears.

The throwing stick (fig. 151) is used by the Esquimaux throughout the regions they inhabit. Frobisher mentions it on the east, Captain Beachey on the north west, and Crantz describes its use in Greenland. Klemm says, that the throwing stick used in the Alleutian Isles, differs from that of the Greenlander in having a cavity, to receive the end of the spear, instead of a projecting tang. The Esquimaux stick generally differs from the Australian in form, and has usually holes cut to receive the fingers, which by this means secure a firm grasp of the instrument. The custom of forming holes or depressions in an implement to receive the fingers was very widely spread in pre-historic times. I have specimens of stones so indented, used probably as hammers, from Ireland, Yorkshire, Denmark, and Central India. In the Christy Collection there is one precisely similar from the Andaman Isles.

The only other race that is known to make use of the throwing stick is the Purus Pursus Indians of South America, inhabiting a tributary of the Amazon. These people have no bow, and in many other respects resemble the Australians in their habits. Their throwing stick is called "palheta;" it has a projection at the end, to fit into the end of the spear, and is handled exactly in the same manner as the Australian wamera.*

Another kind of spear thrower, consisting of a loop for the finger and a thong by which it is fastened to the spear, is used in New Caledonia and Tanna, New Hebrides (fig. 152). On ordinary occasions this is carried by being suspended to an armlet on the left arm, but, when preparing for war, they fasten it on to the middle of their spears. I exhibit here, fig. 153, a precisely similar contrivance from Central Africa, from my collection. Judging by the spiral ferrule at the end of the lance, to which it is attached, it appears to be derived from Central or East Central Africa. This mode of increasing the range of the dart or javelin was well known to the ancients, and was called by the Greeks ἀγκύλη, and by the Romans "amentum;" it is represented on the Etruscan vases,† and is figured in Smith's "Dictionary of Greek and Roman Antiquities," from which the drawing given in fig. 154 is taken. One of the effects produced by this contrivance was, doubtless, to give the weapon a rotary motion, and thereby to increase the accuracy of its flight, upon the same principle as the rifling of a bullet; but the range and velocity were also increased, by enabling the thrower, the tip of whose forefinger was passed through the loop of the "amentum," to press longer upon the spear, and thus impart a greater velocity to it, in the same manner that the effect of the Australian wamera may be said to increase the length of the thrower's arm. The Emperor Napoleon, who, as we all

* "Tribes of the Valley of the Amazon," by Clement Markham, Esquire.—Trans. Ethno. Soc., vol. 3.

† Smith's "Dictionary of Greek and Roman Antiquities."—Hasta.

know, has paid great attention to these weapons of the ancients, caused experiments to be conducted, under his own personal supervision, at Saint Germain, the result of which shewed that the range of a spear was increased from 20 to 80 meters by the use of this accessory.*

Transition from Club to Shield (Australia). (Plate XXI).

My next example of variation of form is taken from the Australian "hieleman," or shield. It may, on the first cursory consideration of the subject, appear fanciful to suppose that so simple a contrivance as the shield could require to have a history, or that the plain round target, for example, so common amongst many savage nations, could be the result of a long course of development. Surely, it may be said, the shells of tortoises or the thick hides of beasts would, from the first, have supplied so simple a contrivance. But the researches in palæo-ethology teach us that such was not the case; man came into the world naked and defenceless, and it was long before he acquired the art of defending himself in this manner. His first weapon, as I have already said, was a stone or a stick, and it is from one or other of these, that we must trace all subsequent improvements. The stick became a club, and it is to this alone that many of the earliest races trust for the defence of their persons. The Dinkas of East Central Africa have no shields, using the club, and a stick, fig. 170, hooked at both ends, to ward off lances.† The Shoua and the Bagirmi of Central Africa rarely carry shields, and they use a foreign name for it.‡ The Khonds, hill tribes of Central India, have never adopted the shield.§ The inhabitants of Tahiti use no shield;‖ the Sandwich Islanders use no shield or weapon of defence, employing the javelin to ward off lances: like the Australians, and, like the Bushmen, they are very expert in dodging the weapons of their enemies. In Samoa the club is used for warding off lances, and the warriors frequently exercise themselves in this practice. The kerri sticks of the Hottentots are used for warding off stones and assegais.¶

The club head formed by the divergent roots of a tree, fig. 155, offers great advantages in enabling the warrior to catch the arrows in their flight, and this led to the use of the jagged mace head form of club, which is here represented from many different localities. Fig. 155 is from Fiji, fig. 157 from Central Africa, fig. 156 from Australia, fig. 158 from New Guinea, and fig. 159 from the Friendly Isles. The curved clubs, of which a great variety are found in the hands of savages in every part of the world, are exceedingly well adapted to catch and throw off the enemy's arrow. The Australian malga or

* "Die Pfahlbauten des neuenborger sees," von E. Desor, p. 104.
† "Petherick," p. 391.
‡ "Barth," vol. iii, p. 451.
§ "Thirteen Years amongst the Wild Tribes, Khondistan," by John Campbell, C.B.
‖ Elis Polynesian Researches.
¶ "Kolben," p. 292.

"Lowel," as it is called by the Australians now in this country, and already described, is used in this manner.

By degrees, instead of using the club as a general weapon, offensive and defensive, especial forms would be used for defence, whilst others would be retained for offensive purposes; but the shield for some time would continue to be used merely as a parrying instrument. Such it is in Australia. In its most primitive form, it is merely a kind of stick with an aperture cut through it in the centre for the hand. The fore part varies with the shape of the stem out of which it was made; in some it is round, in others flat. This form appears to have branched off into two varieties; one developed laterally, and at last assumed the form of a pointed oval, as represented in figs. 165 to 168 and 169, these are frequently scored on the front with groves to catch the lance points. The other variety appears to have assumed a pointed form in front, so as to make the spear glance off to one side, as represented in figs. 160 to 164. The Australians are exceedingly skilful in parrying with these shields. One of the feats of the Australians now in this country, consists in parrying cricket balls thrown with full force by three persons at the same time. The hieleman is cut out of the solid tree and, like all their other weapons, invariably follows the grain of the wood.

In 1861, Mr. Oldfield, when engaged in collecting specimens of timber for the International Exhibition, came upon one of these shields, nearly finished and abandoned, but only requiring a few strokes to detach it from the growing tree, and he noticed the immense time and labour it must have cost the native to construct it, not less than 30 cubic feet of wood having been removed in digging it out of the tree with no better tool than a flint fixed to the end of a stick. Trees of sufficient size for these shields are not found in all parts of Australia, and in those places where they are wanting, the natives only obtain them by traffic with other tribes. The same cause may also account, in some measure, for the varieties of their form, yet, notwithstanding these numerous varieties, they never leave the normal type throughout the continent, and you might as well expect to see the Australians using a firelock of native manufacture, as to find in his hands the circular flat shield which is common in Africa, America, and ancient Europe.

Transition from Club to Shield (*Africa*). (Plate XXI).

In Africa, the development of the shield appears to have followed precisely the same course, commencing with the plain stick or club, fig. 170, and passing through the varieties represented in figs. 171, 172, and 173, which are scarcely distinguishable from the Australian hieleman, to the oval shield of the Kaffirs, fig. 174, and of the Upper Nile, figs. 175 and 176, which are of ox hide, but show their origin by a stick passing down the centre and grasped in the hand; with this stick they parry and turn off the lances of the assailant precisely in the same manner that the Australian employs the projecting point at the end of his oval shield. Judging by the side views represented in the Egyptian and Assyrian sculptures, similar shields were used by the ancients, and we

may especially notice the Assyrian shield, of small dimensions, fig. 178, mentioned by Mr. Rawlinson as being represented in the Assyrian sculptures, and having projecting spikes on the fore part, to catch and throw off the enemy's weapons.

Development of the Shield.

All these antique shields have one other feature in common with the shields of existing aborigines, viz., that they are held by a handle in the centre. It was only in a more advanced age when armies began to fall into serried ranks, that the broad shield was introduced and held upon the left arm, a mode of carrying it ill adapted to the requirements of the light-armed combatants. Besides the oval, the shield took other forms, but appears always to have been narrow in its earliest developments, fig. 176 from the Upper Nile closely resembles in outline fig. 177 from the New Hebrides. Livy describes the shields of the Gauls in the attack of Mount Olympus, B.C. 189, as being too narrow to defend them against the missiles of the Romans, and he also describes them as brandishing their shields in a peculiar manner practised in their original country.* This must without doubt have been connected with the operation of parrying. Sir Walter Scott describes the Scotch parrying with their shields. Shields in the form of a figure 8 are met with in various countries; Captain Grant describes the Unyamuezi as carrying a shield of this form.† Fig. 179 from this Institution is from Central Africa of a very primitive form. Fig. 180 is of the same shape from New Guinea, and the beautiful bronze shield, fig. 181,‡ of the late Celtic period in the British Museum found in the Thames, appears to be of an allied form. Fig. 182 is an ox-hide shield of the Bassutos, it is allied to that of the Kaffirs, Fig. 174, by having a stick at the back; and the peculiar wings with which it is furnished, connect it with that of the Fans of the Gaboon, on the West Coast, fig. 183, which latter is of elephant hide and has no stick at the back. No connection that I am aware of is known to have existed between these remote tribes which are of totally different races, but the forms of their shields here represented must, I think, have been derived from a common source.

Concluding Remarks.

It would be quite impossible within the space of a single lecture to produce more than a very small portion indeed of the evidence which is available in support of my arguments. If the principles which I have enunciated are sound, they must be applicable to the whole of the arts of mankind and to all time. If it can be proved that a single art, contrivance, custom, or institution, sprung into existence in violation of the law of continuity, and was not the offspring of some prior growth,

* Livy, Book xxxviii, chap. 16.
† "Walk across Africa," by Captain Grant.
‡ Horæ Ferales.

it will disprove my theory. If in the whole face of nature there is undoubted evidence of any especial fiat of creation having operated capriciously, or in any other manner than by gradual evolution and development, my principles are false.

It would be a violation of the law of continuity for example, if the principles which I am now advocating, in common with many others at the present time, opposed as they are to many preconceived notions, were suddenly to receive a general and wide-spread acceptance. This also, like other offsprings of the human mind, must be a work of development, and it will require time and the labours of many individuals to establish it as the truth, if truth it be.

Meanwhile it may be well that I should briefly sum up the several points which I have endeavoured to prove on the present occasion.

I have endeavoured to prove in the first place, though I must here repeat that I have produced only a very small portion of the evidence on the subject, that all the implements of the stone age are traceable by variation to a common form, and that form the earliest; that their improvement spread over a period so long as to witness the extinction of many wild breeds of animals; that it was so gradual as to require no effort of genius or of invention; and that it was identical in all parts of the world.

I have shown in the second place, that all the weapons of the Australians which I have described, are traceable by variation to the same common form, or to forms equally as primitive as those of the stone age of Europe: that it is perfectly consistent with the phenomena observed, that these variations may have resulted, or at least may have in a great measure been promoted by accidental causes, such as the grain of the wood influencing the shape of the weapon: that they were not invented or designed for especial purposes, but that their application to such purposes may have resulted from a selection of the implements already in hand; and that by this process, the natives of Australia, during countless ages, may have crept on, almost unconsciously, from the condition of brutes, to the condition of incipient culture in which they are now found.

I have compared these weapons of the Australians with others of the same form in various parts of the world, showing grounds for believing that whenever we shall be able to collect a sufficient variety of specimens to represent the continuous progression of each locality, the *modus operandi* will be found to have been everywhere the same.

Lastly I have alluded cursorily to the analogy which exists between the development of the arts and the development of species. It may be better to postpone any comprehensive generalization on this subject until a much larger mass of evidence has been collected and arranged. Sir Charles Lyell has devoted a chapter in his work on the antiquity of man to a comparison of the development of languages and the development of species. "We may compare," he says "the persistency "of languages or the tendency of each generation to adopt without "change the vocabulary of its predecessor to the force of inheritance "in the organic world, which causes the offspring to resemble its "parents. The inventive power which coins new words or modifies

"old ones, and adapts them to new wants and conditions as often as "they arise, answers to the variety-making-power in the animal crea- "tion." He also compares the selection of words and their incorporation into the language of a people, with the selection of species, resulting in both cases in the survival of the fittest.

Whilst, however, we dwell upon the analogy which exists between the phenomena of the organic world and the phenomena of human culture, we must not omit to notice the points of difference. The force of inheritance may resemble in its effects the principle of conservatism in the arts and culture of mankind, but they are totally dissimilar causes.

The variety-making-power may resemble the inventive power of man; nothing, however, can be more dissimilar, except as regards results.

When, therefore, we find that like results are produced through the instrumentality of totally dissimilar causes, we must attribute the analogy to some prior and more potent cause, influencing the whole alike.

It might be premature to speculate upon the course of reasoning which this class of study is likely to introduce; this much however, we may, I think, safely predict as the result of our investigation, that we shall meet with no encouragement to deify secondary causes.

Another subject to which we must necessarily be led by these investigations, although, as I before said, it does not fall actually within the scope of my paper, is the question of the unity or plurality of the human race.

The ethnologist and the anthropologist who has not studied the prehistoric archæology of his own country, compares the present condition of savages with that of the Europeans with whom they are brought in contact. He notices the vast disparity of intellect between them. He finds the savage incapable of education and of civilization, and evidently destined to fall away before the white man whenever the races meet, and he jumps at the conclusion that races so different in mental and physical characteristics, must have had a distinct origin, and be the offspring of separate creations. But the archæologist traces back the arts and institutions of his own people and country until he finds that they once existed in a condition as low or lower than that of existing savages, having the same arts, and using precisely the same implements and weapons; and he arrives at the conclusion that the difference observable between existing races is one of divergence, and not of origin; that owing to causes worthy of being carefully studied and investigated, one race has improved, while another has progressed slowly or remained stationary.

In this conclusion he is borne out by all analogy of nature, in which he finds frequent evidences of difference produced by variation, but no one solitary example of independent creation. Are not all the branches of a young tree parts of the same organism, and yet one will be seen to throw up its shoots with a vigorous and rapid growth, whilst another turns towards the ground and ultimately decays? Not to mention the variations produced by the breeding of animals, with

which we are all more or less familiar; we see under our own eyes families of men diverging in this manner. One branch, owing to causes familiar to us in every-day life, will become highly cultivated, whilst another continues to live on in a low condition of life, so that in the course of a few years the disparity, mental and physical, between these two branches, bearing the same name, will be greater in proportion to the time of separation than that which in the course of countless ages, has separated the black from the white man.

At the present time there is a tendency to rectify these inequalities, whether in regard to our own or to other races, and there can be little doubt that in the course of time, all that remains of the various races of mankind will be brought under the influence of one civilization. But as this progressive movement is often led by men who have not made the races of mankind their study, they are perpetually falling into the error of supposing, that the work of countless ages of divergence, is to be put to rights by Act of Parliament, and by suddenly applying to the inferior races of mankind, laws and institutions for which they are about as much fitted as the animals in the Zoological Gardens.

In conclusion, I have only a few words to say upon the defects of our ethnographical collections generally. It will be seen that in order to exhibit the continuity and progression of form, I have been obliged to collect and put together examples from many different museums; and, as it is, it will have been noticed that many links of connection are evidently wanting. This is owing, in a great measure, to the very short period during which the arts and customs of primeval races have been made the subject of scientific investigation; but it also arises from the absence of system on the part of travellers and collectors who in former times appear to have had but little knowledge of the evidence which these specimens of the industry of the aborigines is destined to convey, and who have, therefore, neglected to bring home from the various regions they visited all the varieties of the several classes of implements which each country is capable of affording, thinking that one good example of a tool or weapon might be taken as a sample of all the rest.

I am not so presumptuous as to suppose that the particular arrangement which I have adopted, may not require frequent modification as our evidence accumulates, but I trust that I shall at least have made it apparent to those who have followed the course of my argument, that without the connecting links which unite one form with another, an ethnographical collection can be regarded in no other light than a mere toy-shop of curiosities, and is totally unworthy of science.

Owing to the wide distribution of our Army and Navy, the members of which professions are dispersed over every quarter of the globe, and have ample leisure for the pursuit of these interesting studies, this Institution possesses facilities for forming a really systematic collection of savage weapons, not perhaps within the power of any other Institution in the world. The time is fast approaching when this class of pre-historic evidence will no longer be forthcoming. The collection here

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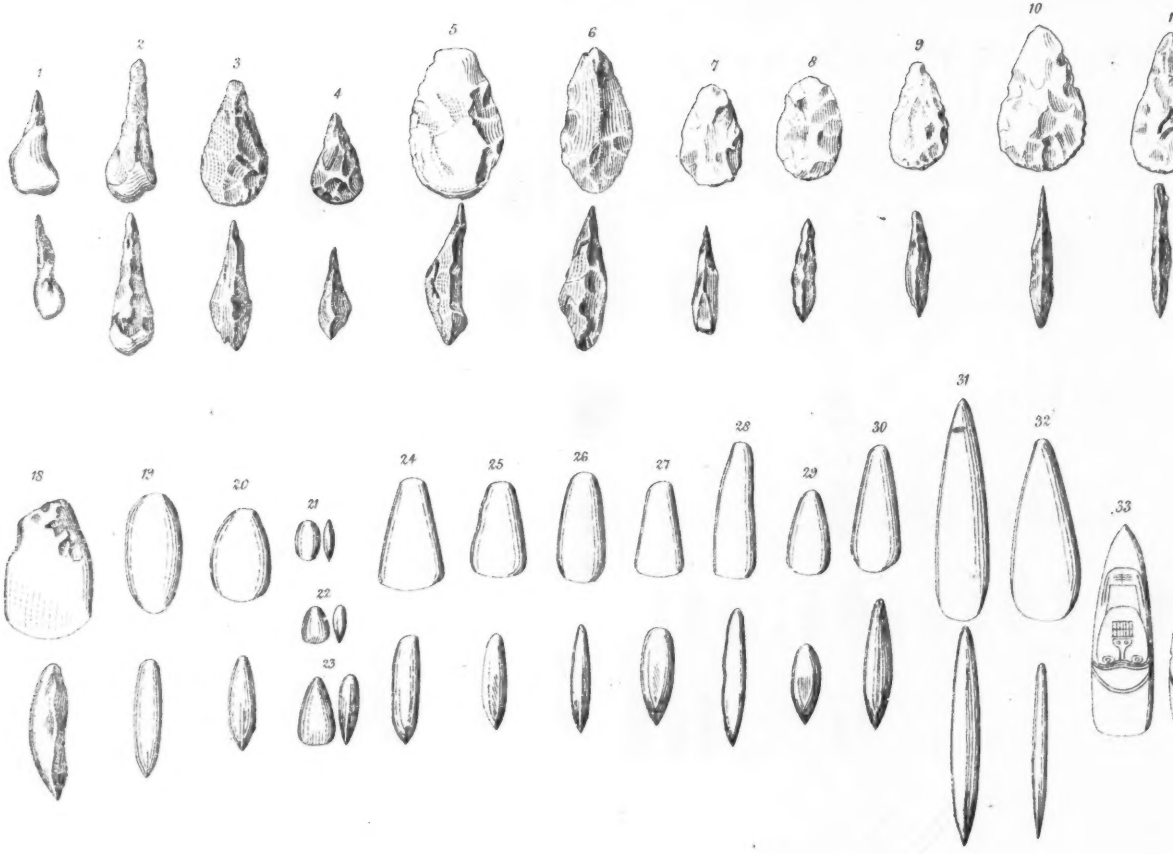

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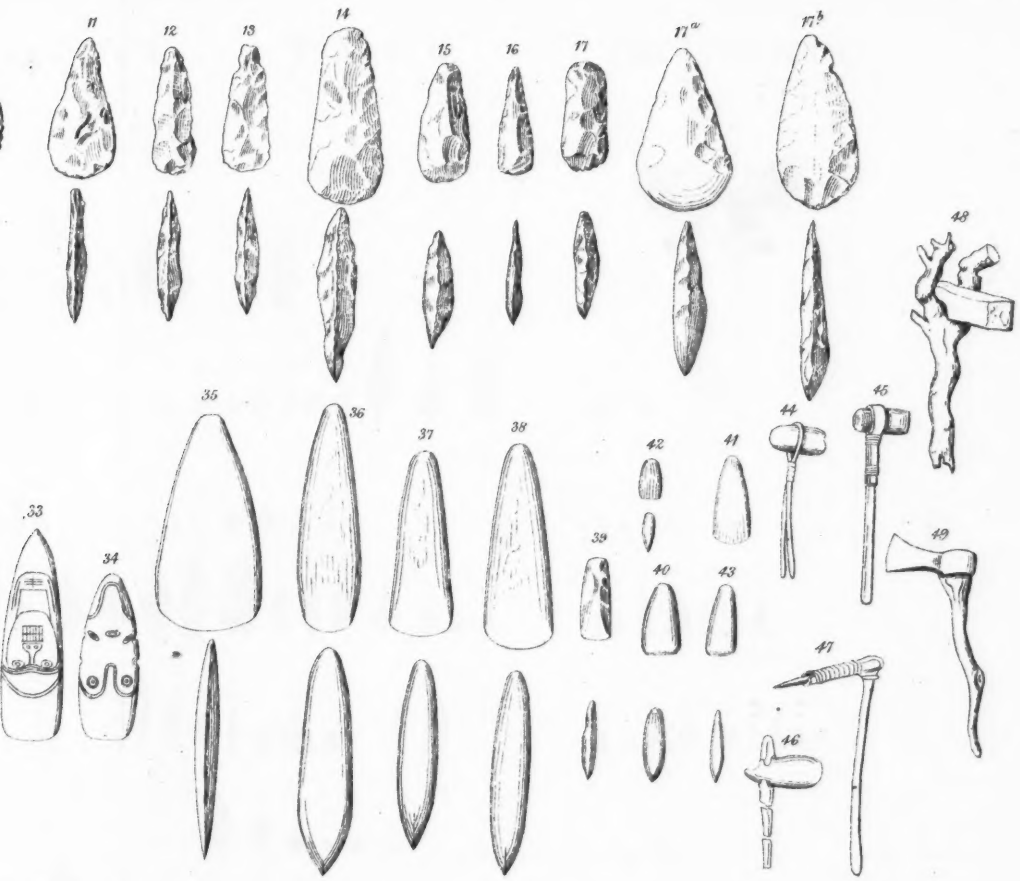

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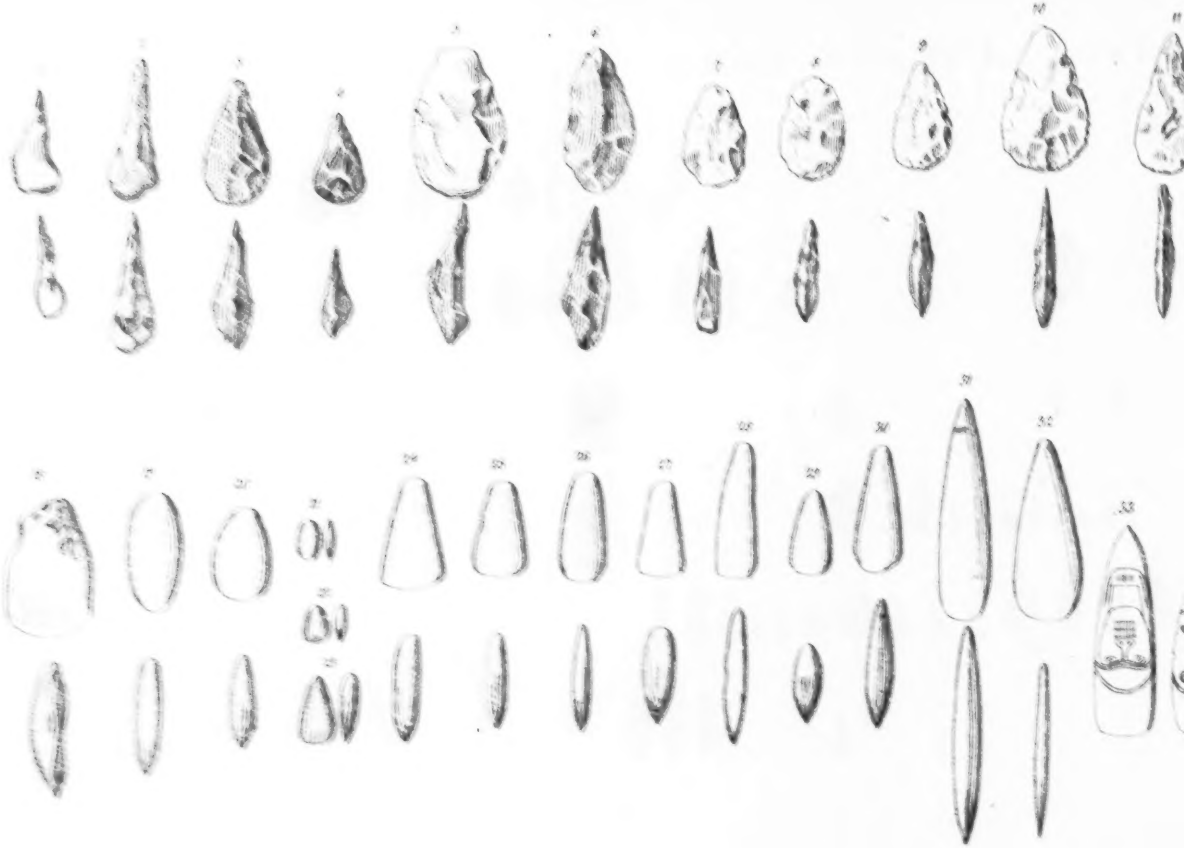

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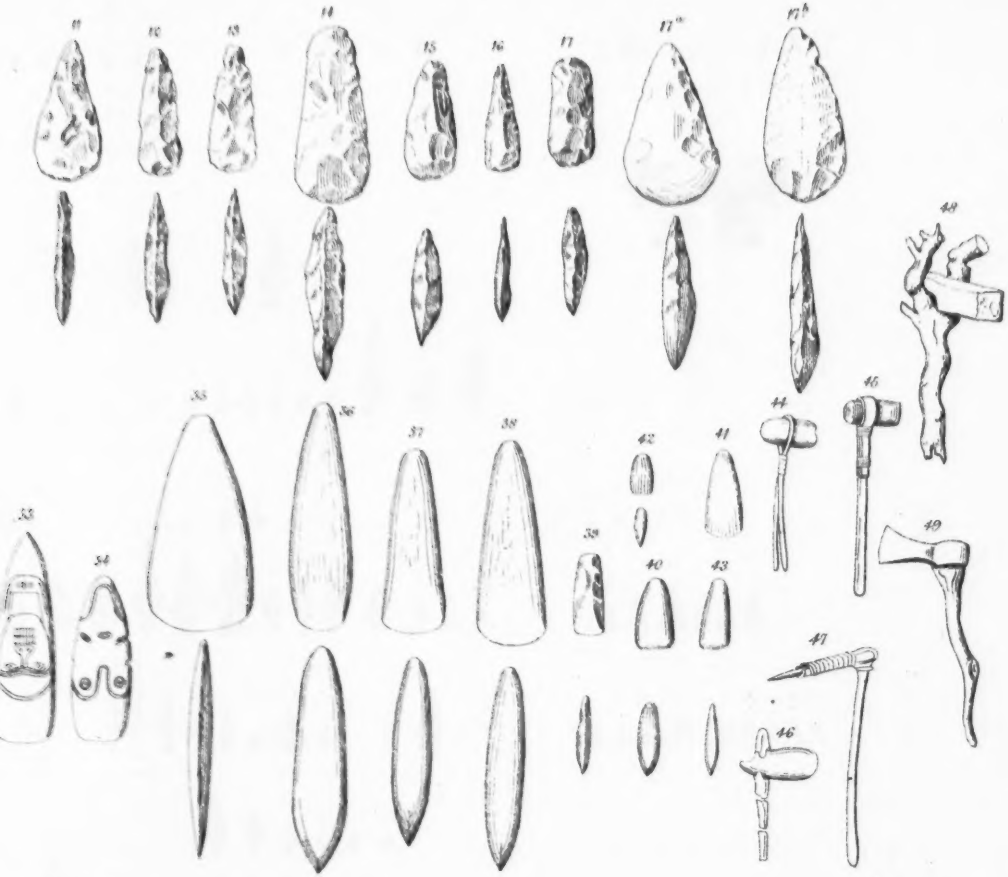

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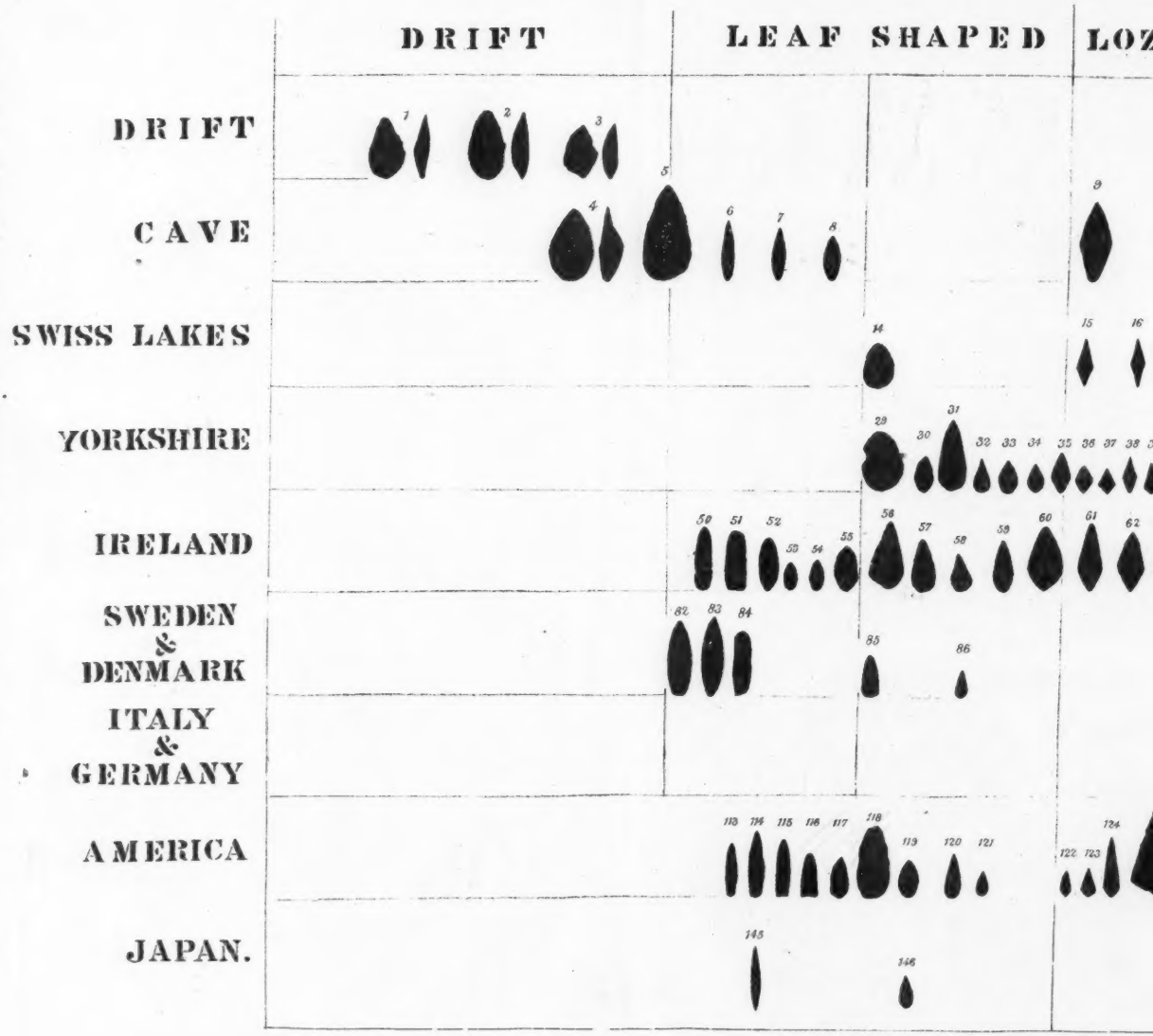

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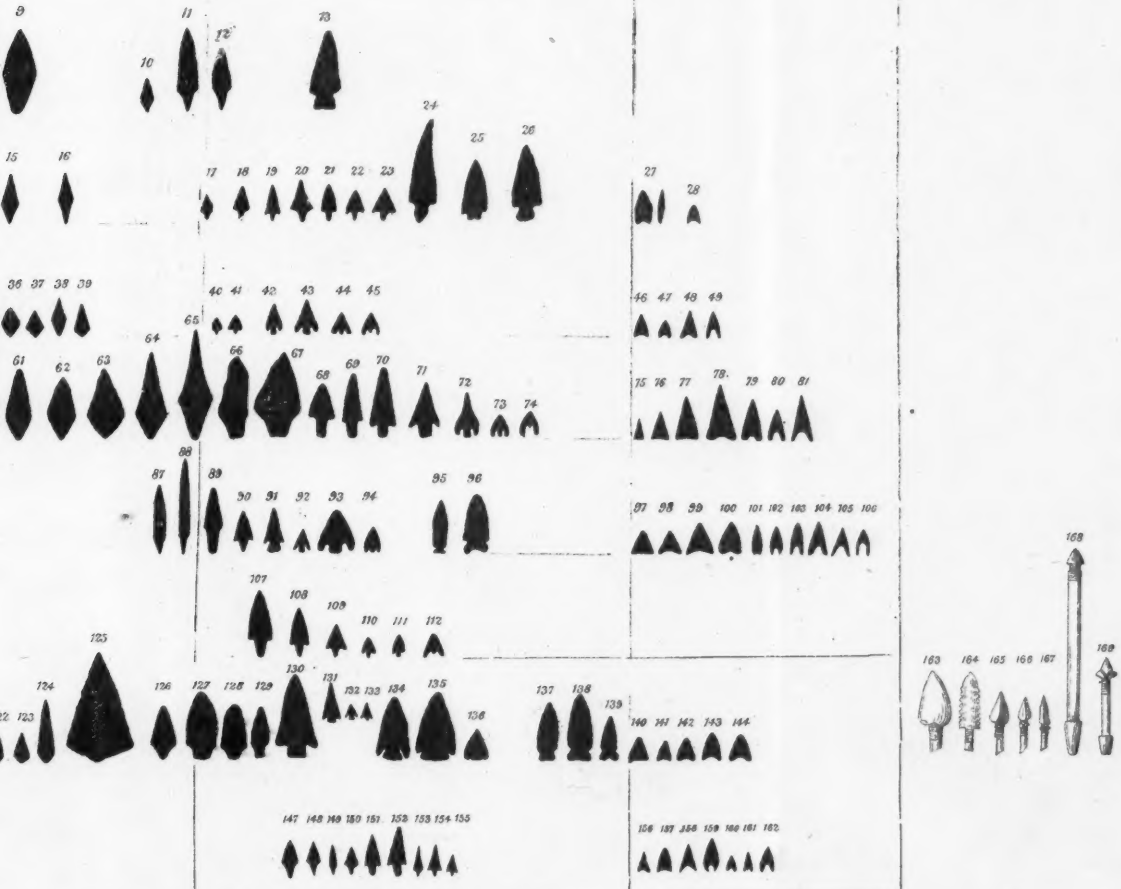
AND ARROW-HEAD FORMS.

Plate XVIII.

LOZENGE — TANG — TRIANGULAR



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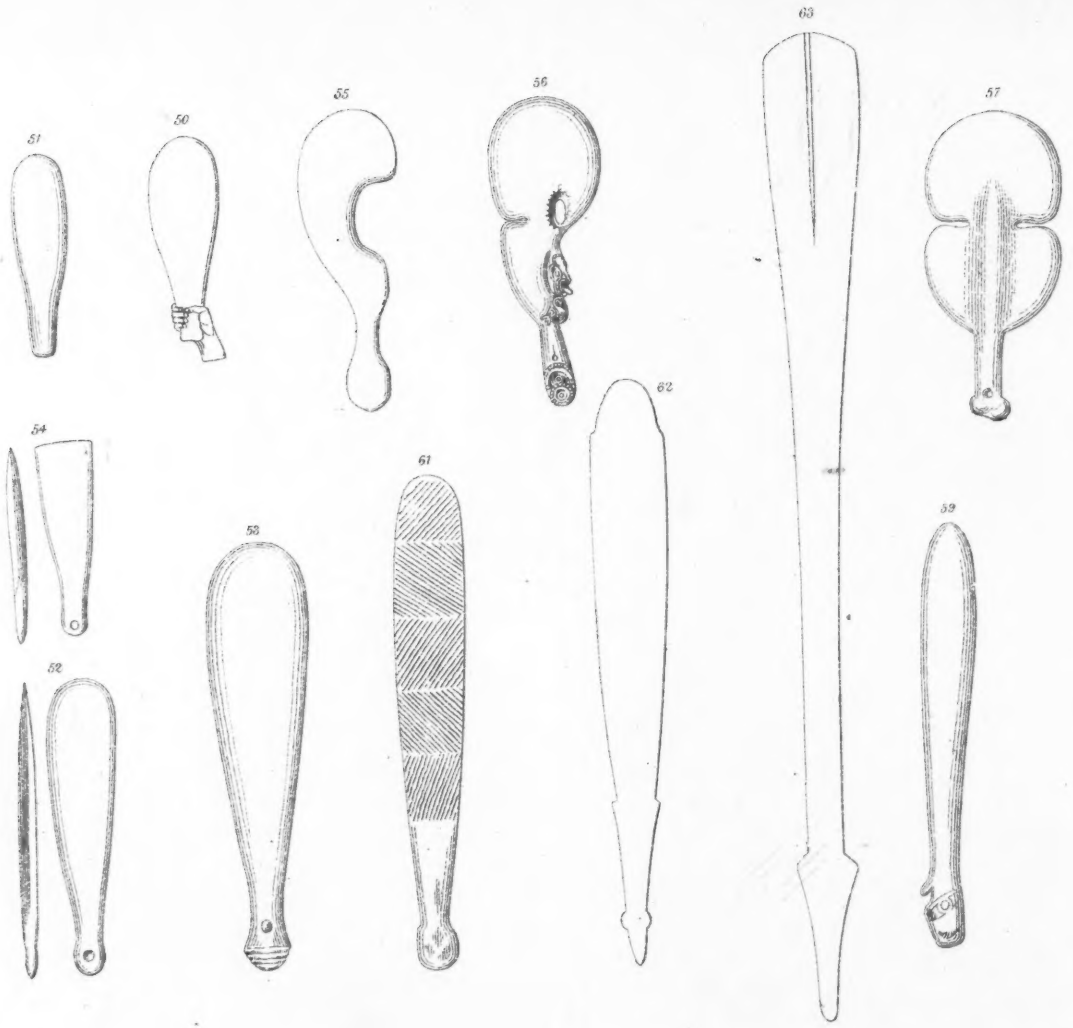

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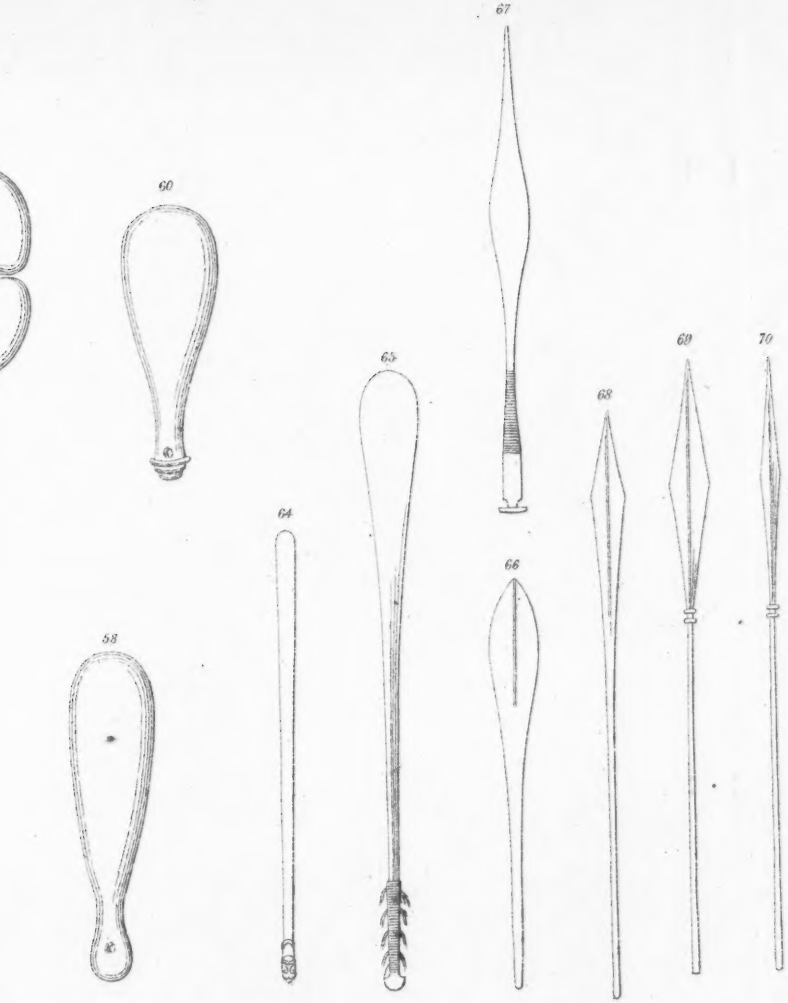

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AUSTRALI

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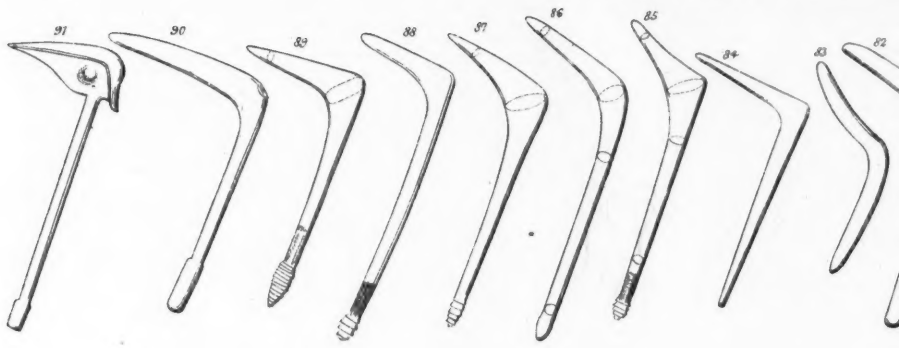

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INDIAN BOOMERANGS.

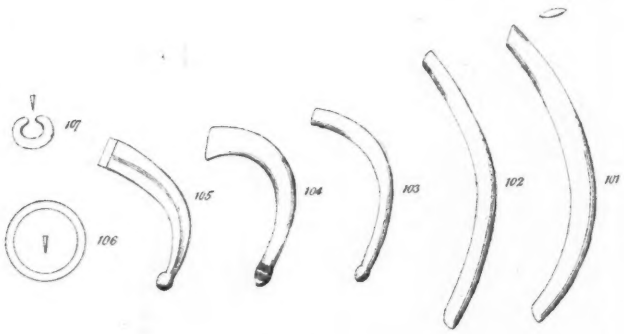

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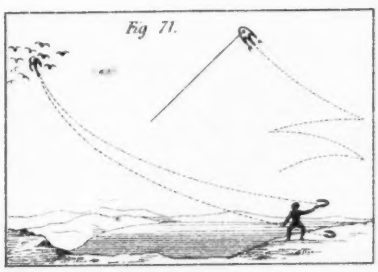
Fig 71.



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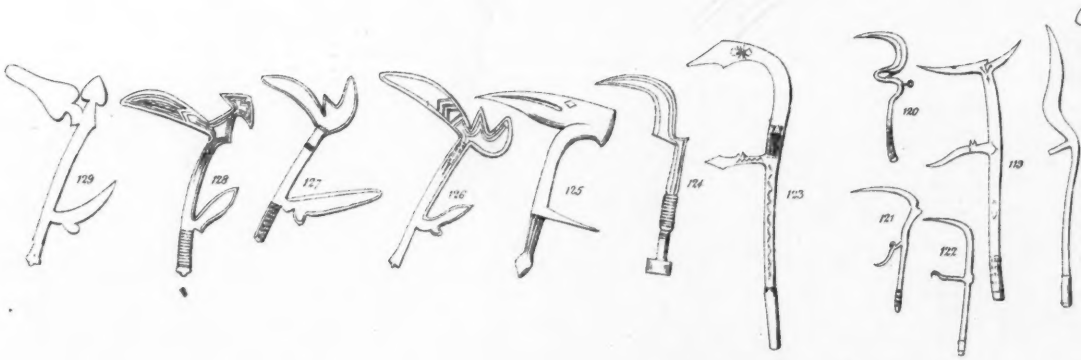

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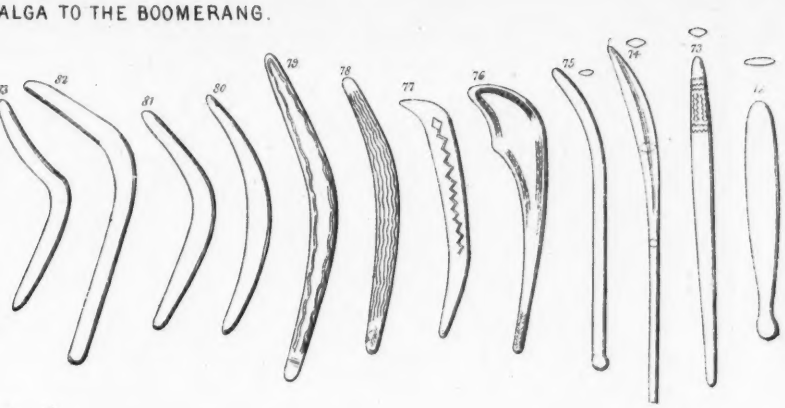
ALGA TO THE BOOMERANG.

Plate XX.



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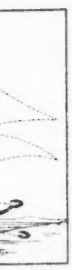
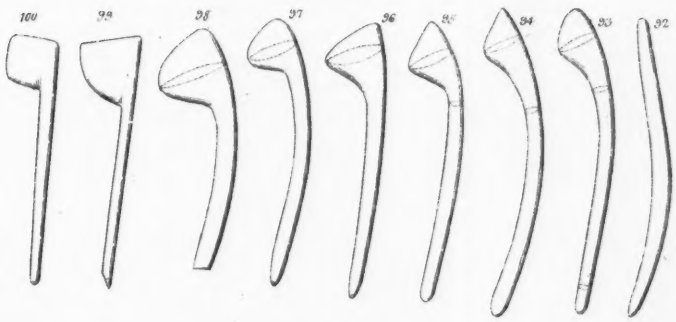
AUSTRALIA.

TRANSITION FROM HATCHET TO THE BOOMERANG.





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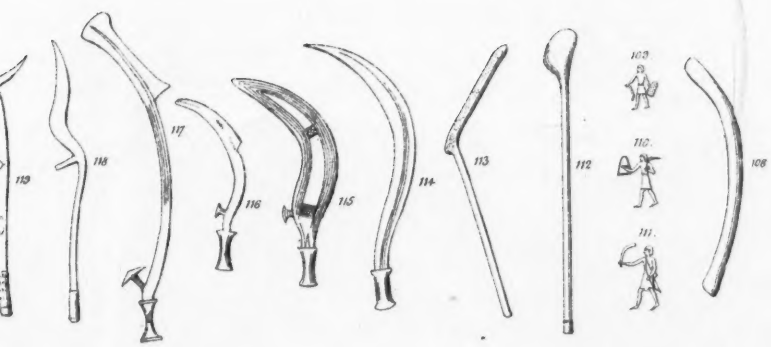

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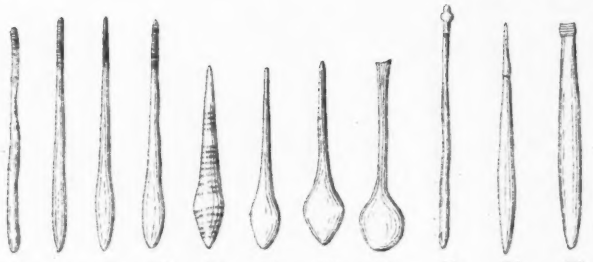
AUSTRALIAN CLUBS

AFRICAN CLUBS



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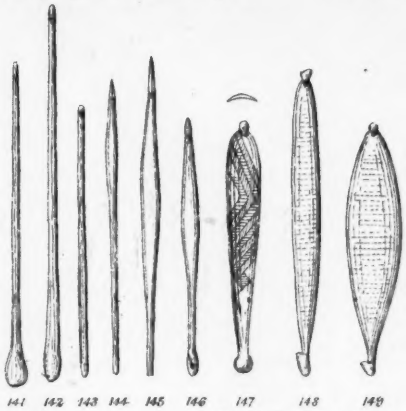

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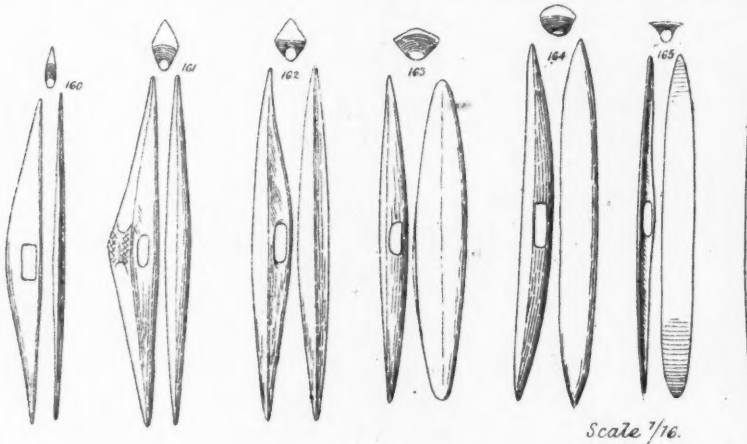

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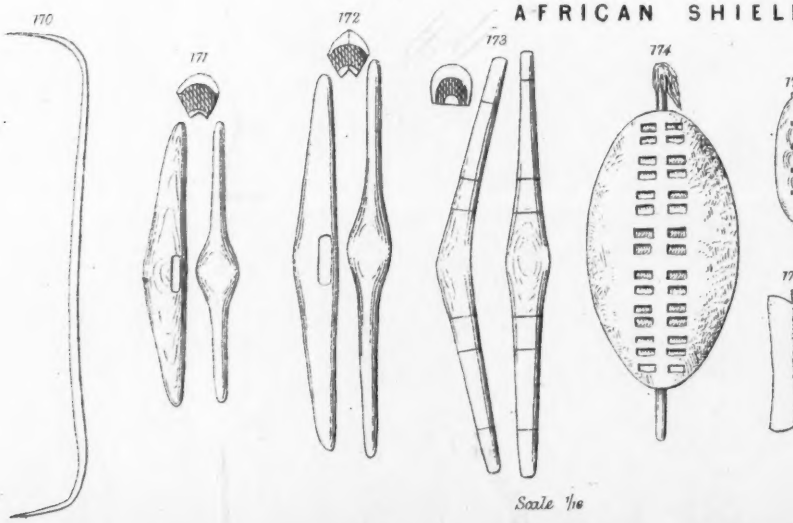

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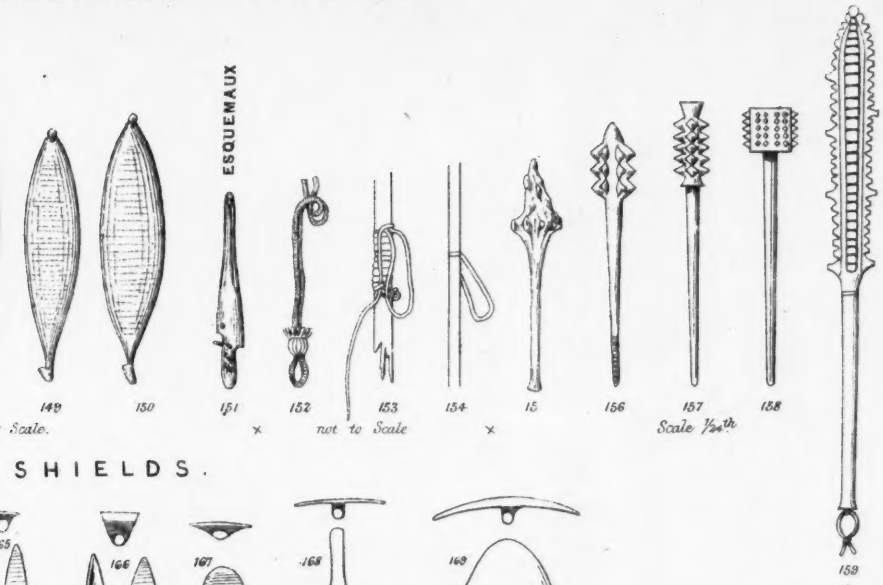
THROWING STICKS.



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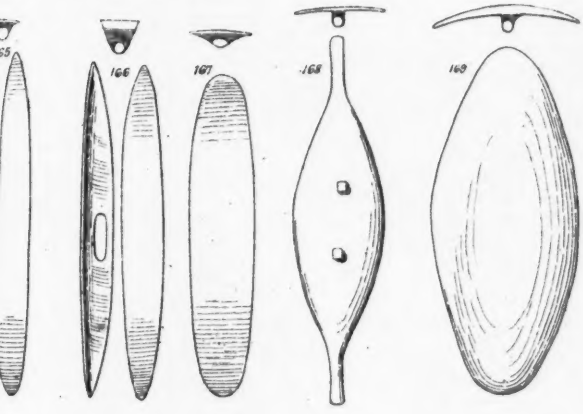

76.

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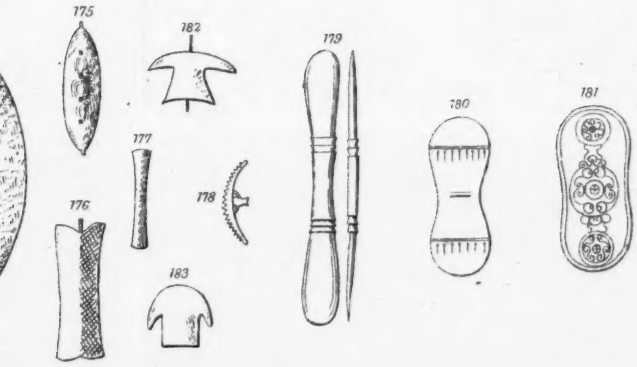

Vincent Brooks Day & Son Lith, London.

Figs 175 to 183 not to Scale.

is already what, for this country, must be regarded as a good one, and if I may venture to hope that the remarks I have now the honour of making will be of service in collecting the materials for the improvement of it, I trust it may be thought, that my labours and your patience will not have been thrown away.

LECTURE.

Friday, June 26th, 1868.

LIEUTENANT-GENERAL HENRY EYRE, in the Chair.

THE BATTLE OF KÖNIGGRÄTZ.

By Colonel WALKER, C.B., Military Attaché, Berlin.

IT has occurred to me that in connection with the purchase of a model* of the great battle ground of the 3rd July, 1866, a relation of the events preceding and belonging to that eventful day may not be unacceptable to the members of the Royal United Service Institution. My description must to a certain extent be from a Prussian point of view; but I am sure that my hearers will fully agree with me in feeling that all unavoidable criticism should be forborne, and I purpose therefore to confine myself to such a relation of these events, based on reliable sources from both sides, and on personal observation, as may avail to present to them a fairly clear view of this combat of giants. The task of criticism may well be left to others, more capable of forming and more justified in expressing their opinions on such matters.

On the 2nd July, the Prussian forces consisting of the Elbe Army (three divisions, under General Herwarth), the first army (three corps under Prince Frederick Charles), and the second army (four corps, under the Crown Prince), were extended over a line stretching from Smidar to Gradlitz on the Elbe, in the positions which I first propose to detail, while the Austrians and Saxons lay in a position which they had taken up on the 1st July, behind the Bistritz and Trotina.

The Elbe Army consisting of the 14th, 15th, and 16th divisions, occupied the line of Chotelitz, Hoch Wesely, and Lhota, with its advanced guard at Smidar, and its reserve artillery at Welhost.

The first Army, consisting of the second, third, and fourth corps, and the reserve cavalry corps under Prince Albrecht of Prussia, bivouacked in the district marked by the villages or small towns, Aujezd-Sylvara, Wostromer, Gutwasser, Horitz, Dobes and Miletin, with advanced guards at Milowitz and Gross Jeritz.

The second Army lay with the first corps at Ober Praussnitz, the Guard at Königinhof and Neu Rettendorf, and the fifth and sixth corps at Gradlitz.

* The maps are, the one a reproduction of the sketch map published with the Prussian official account of the campaign, the other the ground plan of the model of which the lecture is an explanation.—B. W.

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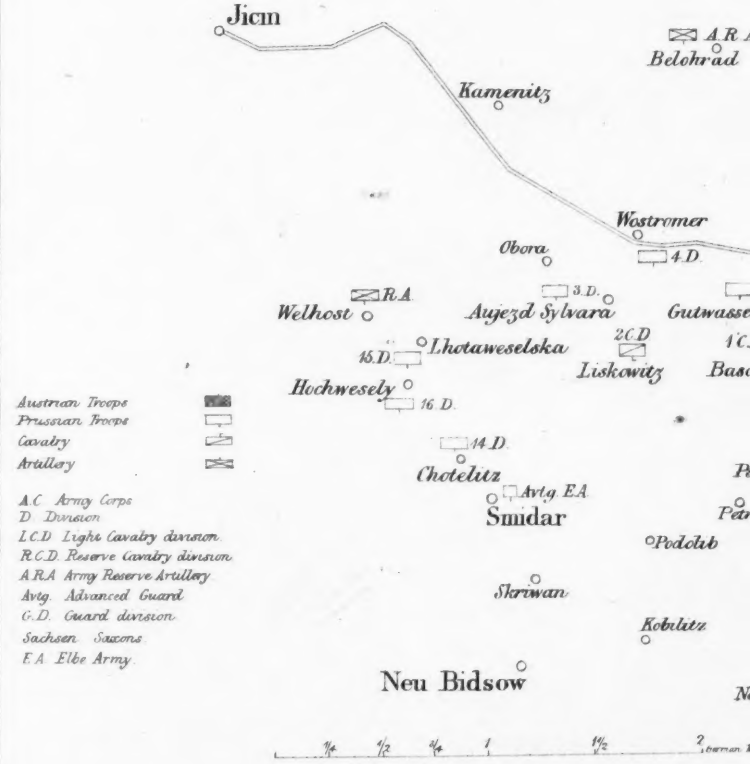
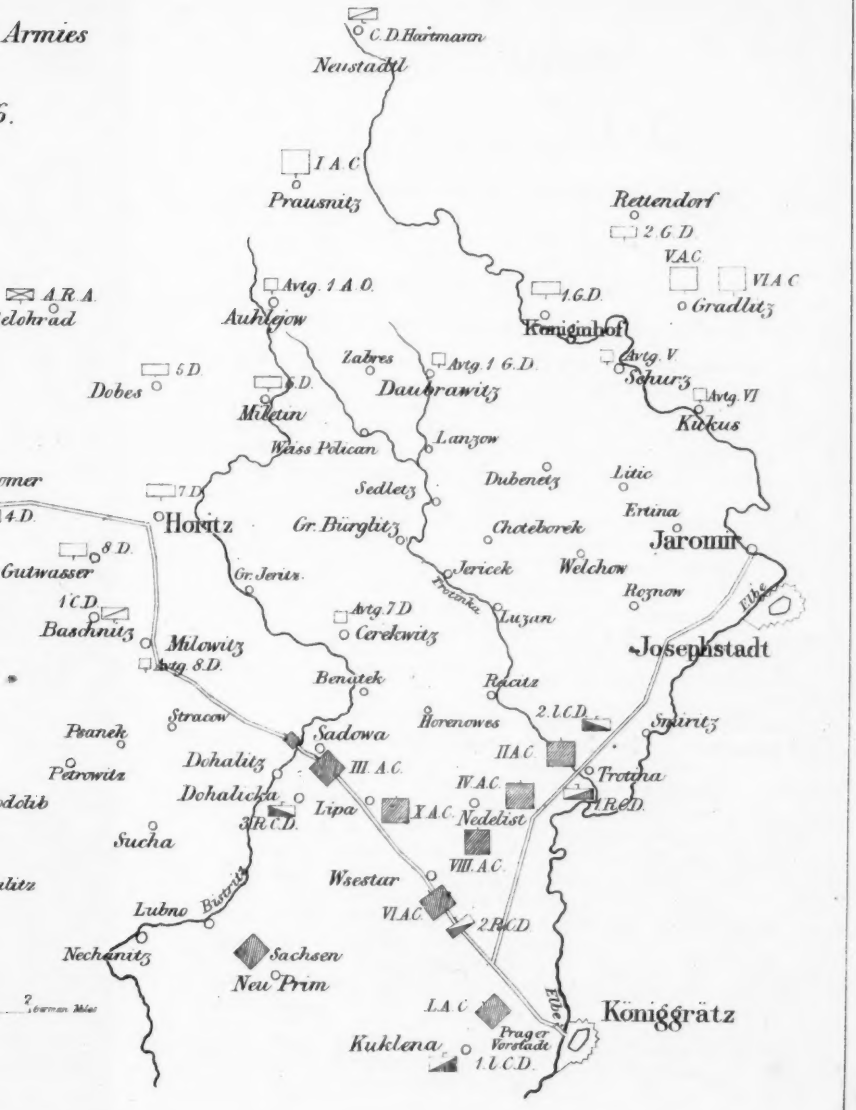
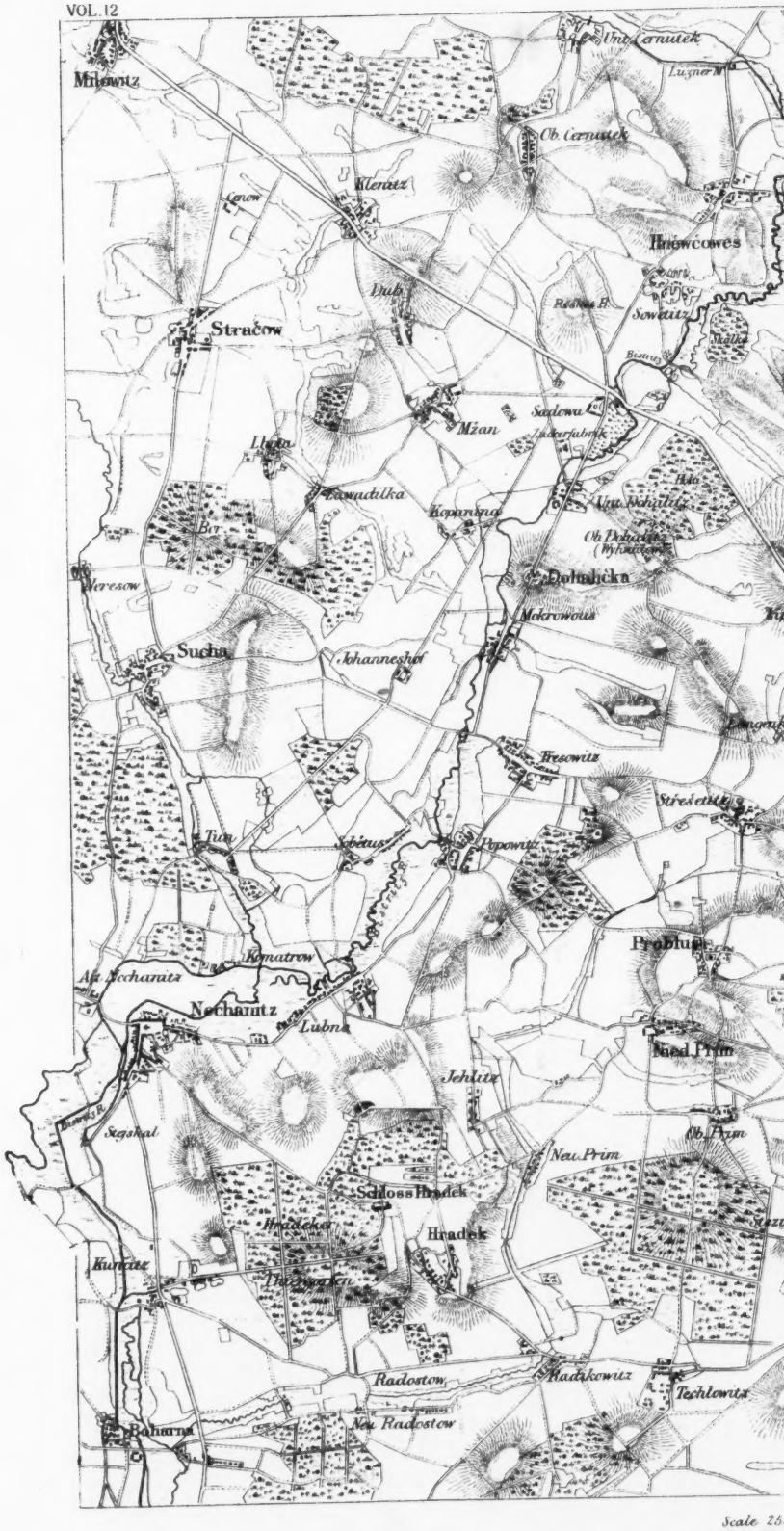
Position of the hostile Armies on the evening of the 2nd July 1866.




Armies
6.
C.D.Hartmann
Neustadtl
I A.C.
Prausnitz
Rettendorf
2.G.D.
V.A.C.
VI A.C.
Gradlitz
A.R.A.
elohrad
Avtg. 1 A.D.
Auhlegow
1.G.D.
Königinhof
Avtg. V
Schurz
Avtg. VI
Kukus
Zabres
Avtg. 1 G.D.
Daubrawitz
5.D.
Dobes
6.D.
Milcin
Lanzow
Wass Pelican
Litic
Dubenetz
Sedletz
7.D.
Horitz
Gr. Burglitz
Chateborek
Ertina
Jaromir
8.D.
Gutwasser
Gr. Jeritz
Jericek
Welchow
Reznow
1.C.D.
Baschnitz
Avtg. 7.D.
Cerekwitz
Luzan
Milowitz
Avtg. 8.D.
Josephstadt
Benatek
Racatz
Stracow
Horenowes
2.I.C.D.
Smiritz
Pranek
Sadowa
Dohalitz
III. A.C.
II A.C.
Trotina
Petrowitz
Dohalicka
IV.A.C.
1.R.C.D.
Lipa
X.A.C.
Nedelist
3.R.C.D.
Sucha
VIII. A.C.
Wsestar
Lubno
VI.A.C.
2.R.C.D.
Nechanitz
Sachsen
Neu Prim
I.A.C.
Königgrätz
Prager Vorstadt
Kuklena
1.U.C.D.
Elbe

J. Jobbins

BATTLE-FIELD
3RD J



Scale 25

- FIELD OF KÖNIGGRÄTZ.
3RD JULY 1866.

Pl XXI b

Scale 2500 paces = 1 german mile.

J Jobbins.

The head-quarters of Prince Frederick Charles were at Kamenetz; those of General v. Herwarth, who stood under the immediate orders of the Prince, at Hoch Weseley; while the Crown Prince was at Königinhof.

His Majesty the King left Berlin on the 30th June, for the purpose of taking command of his combined armies in Bohemia; heard while passing through Reichenberg, of the great success achieved by the first Army at Gitschin; reached Sichrow on the 1st July, and on the 2nd established his head-quarters at Gitschin. But little was known of the actual disposition of the Austrian forces. The movements taking place were not supposed to include more than three or four corps; and it was generally supposed that the Austrian North Army would be found behind the Elbe, with its flanks covered by Josephstadt on the right, and by Königgrätz and the river Adler on the left, while the movements of troops on the plateau of Dubenetz were intended to cover this concentration.

Two lines of operation therefore suggested themselves; either the enemy must be attacked in his position, or out-manœuvred into relinquishing it. From all that I have heard since on the subject, it appears manifest that the latter was in course of adoption, that it was intended to execute a flank march towards Pardubitz, and to compel the Austrian Army to cede its advantageous position by threatening its communications with Olmütz and the capital. In either case great difficulties presented themselves, and it was therefore determined that the following day should be devoted to partial rest after the fatiguing marches and almost incessant fighting of the preceding week, and to reconnoitring the position of the enemy. For this purpose General v Herwarth was directed to move towards Chlumetz, so as to keep an eye on Prague, and secure the passages of the Elbe, near Pardubitz: the first Army was to move by a right incline into the line of Horitz-Neu Bidzow, reconnoitring with a part of the left wing towards Sadowa: the first corps had orders to push forward through Miletin towards Bürglitz and Cerekwitz, so as to cover the subsequent flank march of the second Army, and keep up the connection between the two Armies: and the remaining corps of the second Army were to remain in their bivouacs on the left bank of the Elbe, under the protection of strong reconnoitring parties in the direction of the small rivers Aupa and Mettau.

Should it be ascertained either that the supposed position proved too strong for attack, or that the Army had been already withdrawn, the general movement towards Pardubitz was to be carried out.

Such were the impressions under which the wet and cheerless evening of the 2nd July closed on the actors in the great drama of the succeeding day. At the head-quarters of the second Army, a day of partial rest was fully expected, and it was proposed at dinner that certain members of the staff should ride out after breakfast, and take part in the projected reconnaissance towards the Aupa and Mettau. As for myself I was billeted on the Roman Catholic rector of Königinhof, where I had a comfortable room, and a bed with clean sheets, in which I proposed to take full indemnification for our bivouac at Eypel,

on the 28th, and for three nights of unrest on a knotty and broken-down sofa, at Praussnitz.

It was at the head-quarters of Prince Frederick Charles that the first reliable news of the hostile force was obtained. The Prince, who had been to Gitschin to wait upon the King, learnt soon after his return, that a detachment of the 27th Regiment, at Cerekwitz, the most advanced outpost of General v. Fransecky's (the 7th) division, reported the existence of an Austrian camp at Lipa; while two cavalry patrols,—one conducted by an Officer of the staff, the other by an Officer of the 10th Hussars, had lit on strong parties of Austrian cavalry, the one near Dub, the other near Benatek, from which they had only saved themselves by hard riding,—had ascertained that the heights near Dub were occupied by an Austrian brigade; that the third Army corps was near Sadowa; that the first and tenth were somewhere in the neighbourhood; and that a strong force of cavalry, with a numerous artillery, was near Lipa, and the Saxons at Problus. These reports reached Kamenetz between six and seven o'clock in the evening of the 2nd July.

It is now known, that, in the night between the 30th June and the 1st July, the whole Austrian Army, with the exception of the first corps and of the Saxons who had been opposed to the advance of the first Prussian Army, had withdrawn from their position on the plateau south-east of Königinhof to another not far removed from that in which it accepted battle two days later.

The first column, composed of the third and tenth corps, with two divisions of cavalry, moved from Gross Bürglitz and Liebthal to Lipa, one division of cavalry occupying a bivouac between Dohalitz and Dohalicka; the sixth corps and a division of cavalry moved through Dubenetz and Horjnowes, taking post at Wsestar; the fourth and eighth corps by Litic and Nesnasow to Nedelist; and the second corps, with the remainder of the cavalry, by the right bank of the Elbe, through Dölzen to Trotina. These movements were only completed on the evening of the first July, by which time the first Austrian corps had reached its ground between Wsestar and the fortress, while the Saxons stood between Lubno and New Prim.

As I shall presently return to a detail of the positions they subsequently took up, I will now proceed to sketch the results of the above mentioned reports to the head-quarters of the first Prussian Army at Kamenetz. It was known that the second Army had been engaged with four different Austrian corps during the operations of the previous week, while the concentration of troops near Sadowa led to the conclusion that an attack on the Prussian right was contemplated. After due consideration of this probability, Prince Frederick Charles issued the following orders to the first and Elbe armies, and wrote in explanation of his intentions to the Crown Prince. These measures were completed at about 9 P.M., when his Royal Highness despatched General v. Voigts Rhetz, the chief of his staff, to Gitschin, for the purpose of making a full report to the King, and of obtaining his Majesty's sanction to the projected operations.

The dispositions made for the advance of the first Army will be

gathered from the subjoined translation of the orders issued on the occasion:—

"The first Army will be formed in order of battle at daybreak to-
"morrow in front of the position on the Bistritz, near Sadowa, on the
"Horitz Königgrätz high road.

"1. The division Horn* will stand at 2 A.M. at Milowitz.

"2. The division Fransecky† proceeds past Gross Jeritz and Cerek-
"witz, and will stand at 2 A.M. in the position at the chateau of the
"last named place.

"3. The divisions Manstein and Tümpling,‡ under command of
"Lieutenant-General v. Manstein, move at 1.30 A.M. into a reserve
"position south of Horitz, the division Manstein to the east, the
"division Tümpling to the west of the Horitz Königgrätz high
"road. It is expected that both divisions will be in their places at
"3 A.M.

"4. The second Army corps moves with one division to Psanek,
"the other to Bristan. Both divisions will be at their posts by
"2 A.M.

"5. The cavalry corps will saddle at daybreak, and remain in its
"bivouacs till further orders.

"6. The reserve artillery of the Army will move to Horitz; the
"reserve artillery of the third corps *à cheval* of the high road Horitz-
"Miletin; the reserve artillery of the fourth corps *à cheval* of the
"Horitz-Gitschin-Libonitz high road.

"7. The General of Infantry v. Herwarth 1st will move with all
"his available force against Nechanitz, so as to arrive there as early
"as possible.

"8. His Royal Highness the Crown Prince has been requested to
"make a demonstration against Josephstadt with one or two corps,
"and to march another corps on Gross Bürglitz.

"9. The troops on the left wing must themselves provide for
"taking up the communication with the second Army; those on
"the right with the troops of General v. Herwarth, as early as
"possible.

"10. The trains move with daybreak into the following positions,
"there to be parked close to the high roads:—

"Of the fifth division to Masowitz east of that place; of the sixth
"division through Belohrad to the left bank of the brook Jaworka; of
"the seventh division through Domoslawitz to Suirkowitz, west of
"that place.

"The second corps, that of the third division, through Wostromer
"to a point between Wojitz and the high road Horitz-Gitschin; of
"the fourth division, through Aujezd Sylvara to Sobsitz, west of that
"place.

"Of the cavalry corps to Chomutitz.

"Of the reserve artillery of the third corps to Chotec, east of that

* 8th of 4th Corps.
† 7th of 4th Corps.
‡ 3rd Corps.

"place; of the fourth corps, through Wostromer to the right bank of "the brook Jaworka.

"11. I shall be found at Milowitz after daybreak.

"(Signed) The General of Cavalry,
"FREDERICK CHARLES."

At 9.30 P.M. the following letter was forwarded to the Crown Prince:—

"His Majesty the King has informed me of the reconnaissance "towards the Aupa and Mettau to be executed to-morrow (3rd July) "by your Royal Highness. As, however, a reconnaissance under- "taken from hence, and the reports of the outposts to-day have shown "that a very considerable hostile force is concentrated near Sadowa "and Lipa, on the high road from Horitz to Königsgrätz, the advanced "guard of which has been pushed forward to Dub, I intend to attack "the enemy to-morrow, the 3rd July, and in accordance with the "object entrusted to me to throw him back towards the Elbe.

"But as strong detachments of the enemy have moved from "Josephstadt towards the right bank of the Elbe, I can only suppose "that they are intended to operate against my left flank in the event "of my advance on Königgrätz. A diversion of this nature would "compel me to divide my force, and would impede the attainment of "my desired end—the destruction of the enemy.

"I, therefore, request your Royal Highness to move to-morrow, "3rd July, with the guard, or more corps, from Königinhof in the "direction of Josephstadt, on the right bank of the Elbe, as a security "to my left flank. I am the more induced to express this wish that, "on account of distance, I cannot, on my part, expect the early arrival "of the corps of Bonin,* and because, on the other hand, I presume "that in the reconnaissance ordered for to-morrow, your Royal High- "ness will not meet with any very considerable hostile force.

"I beg to add that my left wing will stand at Gross Jeritz and "Cerekwitz.

"(Signed) FREDERICK CHARLES,
"Prince of Prussia."

The order to General v. Herwarth was as follows:—

"The first Army will be formed early to-morrow, at break of day, "for the attack of the position on the Bistritz near Sadowa on the "Horitz-Königgrätz high road. General v. Herwarth will move "with all the troops available to Nechanitz, so as to arrive there as "early as possible. I shall, in the first instance, be found at Milo- "witz."

This order reached General v. Herwarth at half-past 12, midnight; and orders were at once issued to the Elbe Army to march at 3 A.M., the advanced guard commanded by Major-General v. Schoëler, on Nechanitz; Canstein's division† to Neu Bidzow until relieved by the Landwehr division of Lieutenant-General v. Rosenberg, then on

* The 1st.
† 15th of 8th Corps.

Nechanitz; the division Münster* was ordered to cross the Jaworka at Smidar, and march to Lodin, from whence circumstances would decide whether a movement in the direction of Mzan, or through Sucha towards Nechanitz, was most to be desired; the division Etzel† through Smidar, and to follow the advanced guard; as also the reserve artillery, which was, if possible, to branch into the line of march on Nechanitz, if not, to continue its march in the same direction as that of the sixteenth division.

Immediately after the issue of these orders, the chief of the staff started for Gitschin, where he arrived, but just too late to meet Major-General v. Blumenthal, the chief of the staff of the second Army, who had not long left the head-quarters of the King on his return to Königinhof.

His Majesty the King, on learning the fresh news brought by General Voigts Rhetz, at once formed the determination to attack the Austrian Army with his whole force; the dispositions of Prince Frederick Charles were confirmed; and the following memorandum was dispatched by General von Moltke to the head-quarters of the Crown Prince:—

"According to reports received at the head-quarters of the first "Army, the enemy, in the strength of three *corps d'armée*, which will, "however, probably be reinforced, has advanced to a position on the "Bistritz near Sadowa, and it may be expected that an engagement "with the first Army will there take place. Your Royal Highness "will at once make the necessary arrangements to operate with all "the force at your disposal in support of the first Army against the "right flank of the supposed advance of the enemy, and attack as "early as possible.

"The dispositions made this afternoon under other circumstances "are hereby cancelled.

"Gitschin, 11 P.M., 2nd July.

"(Signed) VON MOLTKE."

This order left Gitschin at 12 midnight. It has been erroneously stated that this important order, on which, indeed, as subsequent events proved, the fate of the campaign depended, was entrusted to but one person for delivery. This statement is incorrect. One copy was forwarded through Kamenetz to Königinhof; a second was carried by Lieutenant-Colonel Count Finckenstein, Aide-de-camp to the King, by another route which led past the outposts of the first Army corps, to whose commander a further order was forwarded by the same Officer, informing General v. Bonin of the expected operations, and desiring him at once to hold the corps under his command prepared for immediate movement on receipt of definite orders from his own Commander-in-Chief, on the receipt of which he was to attack independently, according to circumstances. Count Finckenstein reached Königinhof at about half-past three or four o'clock; found General v. Blumenthal just getting into bed, after his fatiguing drive of nearly

* 14th of 7th Corps.
† 16th of 8th Corps.

sixty English miles to Gitschin and back again, and his subsequent reports to the Crown Prince, and despatch of orders to the left wing, in accordance with the previously received request of Prince Frederick Charles.

The Crown Prince was at once called, maps were brought out, staff Officers were roused from their quarters, and at 5 A.M. the necessary orders for an advance of the whole second Army were dispatched to the various corps composing it.

The orders were as follows:—

"From information received here, a hostile attack is expected to "take place to-day on the first Army, posted at Horitz, Milowitz, and "Cerekwitz, and the second Army will move to its support in the fol-"lowing manner:—

"1. The first Army corps will march in two columns over Zabres "and Gross Trotin to Gross Bürglitz.

"2. The cavalry division will follow the first corps to that point.

"3. The corps of the guard will move from Königinhof on Jericek "and Lhota.

"4. The sixth corps to Welchow, from whence it must detach for "the observation of Josephstadt. The reconnaissance ordered for "to-day will not take place.

"5. The fifth corps will follow two hours after the departure of the "sixth corps, and will march on Chotieborek.

"The troops will march as early as they possibly can do so, and "leave trains and baggage behind, which will only come up by special "orders from the head-quarters of the Army.

"Head-quarters, Königinhof, 3rd July, 5 A.M.

"By command,

"The Chief of the Staff,

"(Signed) BLUMENTHAL,

"Major-General."

Having now detailed the positions of the Prussian Armies up to the evening of the 2nd July, and the order of march during that night and the following morning, I proceed to describe those taken up by the Austrians and Saxons, and I avail myself for this purpose of the most authentic documents published in Vienna since the conclusion of the campaign. Before doing so, however, I must endeavour to give some idea of the ground on which the battle was fought.

At the distance of a German mile* and a half from the fortress of Königgrätz, the great highroad to Horitz and Gitschin crosses a small stream, the Bistritz, at the village of Sadowa. The direction of the road is as nearly as possible north-west, that of the stream nearly north and south. The Bistritz covers the front of the position; the highroad, as will be seen later, gave the intended line of retreat in case of disaster.

North of Königgrätz, and at about the same distance, flows another small brook, the Trotina, which, after being joined by the Trotinka at

* A German mile is 4¾ English, or 10,000 German paces.

the village of Racitz, takes a south-easterly course between high banks, and falls into the Elbe at the village of Lochenitz. Due west of Königgrätz, at a distance of rather more than a German mile and a half,* is the small town of Nechanitz, with a bridge over the Bistritz.

Taking Königgrätz as the centre, the arc of a circle drawn on the radius Königgrätz Sadowa will fall a little beyond Racitz, and a little short of Nechanitz, while the chord of this arc will intersect the most important features of the Austrian position. Both streams run for the greater part of their course through marshy ground, there are but few fords, and the Bistritz can only be crossed by cavalry or artillery over bridges at the small villages, the principal of which are those at Sadowa and Nechanitz.

Combined with the not unimportant heights bordering and in some places overhanging their valleys, both streams give prominent cover to the whole front and right flank of the ground taken up by the Austrian and Saxon Armies. At one point only was this protection wanting. Between Benatek and Racitz, the two streams are separated by about half a German mile of *firmer ground*, and it will be seen hereafter in how far this circumstance conduced to the overthrow of the Austrian Army. The interior of the position was admirably adapted for defence. Elevated generally 150, in some parts nearly 300 feet† above the river level, the heights within its rayon gave a marked command over all the approaches. Villages and woods are found as if placed for defence, while the easy slopes in the rear facilitated the movements of troops during the varying fortunes of the day, and afforded free communication between the Army and its reserves, the gradual fall of the slopes from west to east giving great facilities for covering their place of assembly. The whole distance embraced by the front was about 20,000 paces, or two German miles,‡ but as the actual position was somewhat in rear of this front, which was only occupied by outposts and detachments, the strength of the combined Armies tactically fulfilled the requirements of the position.

The Königgrätz Horitz highroad rises gradually from the inundations of the fortress to a point between Briza and Sweti, where two country roads fork, that on the right hand passing through Nedelist and Sendrasitz to Racitz, the left-hand road passing over a considerable elevation on which the villages of Prim and Problus are situated, to Nechanitz.

About a couple of English miles short of Sadowa, the road passes to the left of, and about a thousand paces distant from, the height of Chlum, after which it again falls to the level of the Bistritz at Sadowa, passing, however, at Lipa over an extended ridge, which, dominating within 3,000 paces the bridges at Sadowa and Dohalitz, may perhaps be considered as not only the centre, but the key to the position.

About half way between Lipa and Sadowa the road runs to the right of the wood of Sadowa, sometimes called the wood of Dohalitz.

* 7 English miles.
† Prussian foot as 102·97 to 100 English.
‡ 9 English miles.

Further to the north is the lateral valley in which lies the village of Cistowes, and directly north of this point rises a height covered with the great wood of Maslowed, the highest point of which is nearly 300 feet above the level of the Bistritz, to the right of which the neighbouring height of Horinowes, marked by two lime trees destined to live in the history of this great battle, forms the salient angle of the position, and is thrust out like a bastion into the plain, exactly where, in the interval between the Bistritz and Trotina, the protection afforded by the two streams is wanting.

It will be remembered that during the previous days the allied forces had been concentrated between the Trotina and Bistritz in a narrow position which afforded but limited shelter for so large an Army, in front of the fortress of Königgrätz, and of the river Elbe, while Field Marshal von Benedek had established his head-quarters in the Prague suburb. While the Prussian Armies were extended over a front of more than twenty English miles that of the Allies scarcely exceeded five, and it was out of this crowded situation that the following order, issued on the evening of the 2nd July, set on foot the movements which arrayed the eight corps, and five divisions of cavalry, of which the Allied Armies were composed, in a line extending from Nechanitz to the village of Trotina.

"Königgrätz, Prague Suburb, 2nd July, 1866.

"Intelligence arrived this day shows that large masses of the "enemy's troops are in the neighbourhood of Neu Bidzow, Smidar, and "in the direction of Horic;* partial engagements have already taken "place between the outposts at Kobelitz and Sucha. From the "position of the enemy it may be assumed that an attack will be made "to-morrow, which in the first instance will be directed against the "Saxon Army corps. In this event I order as follows:

"The Royal Saxon corps will occupy the ridge of Popowitz and "Tresowitz, the left wing slightly refused, and covered by its own "cavalry. In front of this position only advanced detachments are to "be thrown out; to the left and somewhat to the rear on the extreme "left flank by Problus and Prim the first light cavalry division will "take post on suitable ground. The 10th corps takes post on the "right of the Saxon corps, and lastly to the right of the 10th the 3rd, "which will occupy the heights of Lipa and Chlum. The 8th corps "will serve as immediate support to the Saxon corps, and will be posted "in rear of it. Troops not herein named will only be held in readiness "so long as the attack is confined to the left wing, but should the "hostile attack assume larger dimensions, and also be directed against "our centre and right wing, the whole Army will take up a position "for battle, and the following will be the dispositions:

"The 4th corps will move up on the right of the 3rd corps to the "heights of Chlum and Nedelist, and on the extreme right flank, next "to the 4th, the 2nd corps. The 2nd light cavalry division will move "to the rear of Nedelist, and remain there in readiness. The 6th

* Horitz, as written by the Prussians.

"corps will assemble on the heights of Wsestar, the 1st corps will "move to Rosnitz, both corps in close formation. The 1st and 3rd "reserve cavalry divisions move to Sweti, the 2nd reserve cavalry "division to Briza.

"Under the second supposition, of a general attack, the 1st and 6th "corps, the five cavalry divisions, finally the reserve artillery of the "Army,* which will take post behind the 1st and 6th corps, form the "reserve of the Army at my sole disposal.

"Early to-morrow the whole Army must be in battle order; the "corps first attacked must at once communicate with the nearest "corps, which will further the transmission of the intelligence "received.

"The 8th Army corps will move at once from its present camp; an "Officer must be sent forward to the Saxon head-quarters, who, ac- "cording to circumstances, that is whether the action has already "commenced or is only imminent, will return to meet the 8th corps, "and conduct it into the ground selected for it in rear of the Saxons. "Should there be no prospect of a hostile attack, the 8th Corps will "occupy the camping ground already pointed out near Charbusitz.

"Should only the left wing of the Army be attacked, I shall be "found with it, in the event of a general action on the heights of "Chlum. Should the Army be compelled to retreat this will take place "on the high road from Holic to Hohenmauth, without disturbing the "fortress.

"Immediately on the receipt of this order, the second and fourth "corps will throw pontoon bridges over the Elbe, namely, the second "corps two bridges between Lochenitz and Predmeritz, the fourth corps "also two bridges at Placka.

"Any extra material required will be furnished by the train of the "sixth Battalion. Should the repair of the approaches to the bridge "sites be found necessary, it will be effected in like manner.

"The first corps will at once cause the engineers of the corps to "throw a bridge over the Adler at Swinar. The execution of these "orders is at once to be reported, verbally or in writing, through "Officers, and the places selected for the bridges must be carefully "designated.

"The dispositions for a possible retreat will be made known to- "morrow.

"(Signed) BENEDEK."

It appears very doubtful whether the last paragraph was ever carried into effect; at least, it has been strenuously denied by more than one of the Austrian Corps Commanders.

In pursuance of these orders, though, to some extent, and indeed in one instance fatally so, not in strict conformity to them, the early morning of the 3rd found the whole Austrian Army in movement towards the high ground east of the Bistritz.

On the extreme left, the Saxon corps occupied the ridge overlooking

* 128 guns.

the Bistritz at the villages of Lubno, Popowitz, and Tresowitz, with one brigade of the division of General Schimpff; while the other took post in Problus and Nieder Prim. Nechanitz was held by a detachment of no great strength, the cavalry division taking up ground to the east of Nechanitz, so as to cover the withdrawal of the outposts. The division of General v. Stieglitz, with the reserve artillery, held the position between Problus and Nieder Prim.

The Crown Prince of Saxony, who appears to have shown eminently soldier-like qualities, and who was, moreover, fortunate in the able assistance afforded by the appointment of Lieutenant-General von Fabrice as chief of his staff, had requested permission to occupy Nechanitz and Hradek in force, but had been refused.

The eighth Austrian corps, having left two battalions in Horenowes, and further weakened by the absence of the brigade Rothkirch, was on the march towards the position allotted to it in support of the Saxons, as was also the first light cavalry division, under Major-General Baron Edelsheim, when the first cannon shots were heard. The tenth corps, sadly reduced by its losses at Trautenau and Soor-Burgersdorf, on the 27th and 28th June, and numbering not more than 18,000 combatants, occupied the sugar manufactory on the right bank of the Bistritz, Unter-Dohalitz, Dohalicka, Mokrowous, and part of the wood of Sadowa, while one brigade held the village of Chlum, until the arrival of the third corps, to which the defence of Chlum, Lipa, and the remainder of the wood of Sadowa had been allotted. So far the plans of the Commander-in-Chief appear to have been carried out; but further to the right, the troops were disposed in a manner to which I beg careful attention, for here it was at a later period of the day that the fate of the battle was decided.

It will be remembered that the fourth corps had been ordered to the ridge between Chlum and Nedelist; the second to extend the line to the right of the fourth; and the second light cavalry division to take post in rear of Nedelist, and it was on this line, as I shall show presently, that the most important fieldworks had been thrown up on the previous day. Instead of carrying out this order, both corps deployed their forces on the line Cistowes, Maslowed, Horinowics. The Brigade Henriquez,* with a regiment of cavalry was left in position near the village of Trotina, and two battalions of infantry held the village of Racitz in advance of the right flank. The reserve corps took post as directed by the orders of the previous evening, the reserve artillery being placed on the heights between Wsestar and Sweti, the two infantry corps near Rosberitz.

The actual length of the Austrian front was about a German mile and a half (seven English miles), including Edelsheim's cavalry and the brigade Henriquez, nearly two German miles, while half a German mile in rear of the centre two complete corps, and four divisions of cavalry, with a reserve artillery force of 128 guns, were assembled on ground from whence free access was afforded to every part of the line.

The works of defence thrown up had been planned on the 1st, and

* 2nd Corps.

executed under the superintendence of Colonel von Pidoll, of the Imperial Engineers, on the 2nd July. They principally consisted of five batteries.

No. 1 was 1,400 paces north of the Church of Nedelist, at the junction of five roads; No. 2, 1,500 paces north-west of the same point, on the declivity below Maslowed; No. 3, 1,000 paces east of the northern end of Chlum, measured from the *debouche* of the main road through the village; No. 4, to the west of this spot; and No. 5, 500 paces from the western outlet of that village. Abatis were also constructed in the wood of Lipa, not far from battery No. 4; there were two more batteries, which we will call 6 and 7, for the protection of the southern skirts of the same point; and rifle trenches were dug in front of No. 3, and on the flanks of Nos. 1, 4, and 5. Indeed the wood of Lipa may be said to have been thoroughly protected, and the protracted resistance encountered here by the first Prussian Army fully justified the prudence of these measures.

The heights of Horinowes, and the line of the Trotina were left entirely without artificial defence, and the efficacy of the more important batteries above-mentioned was completely neutralized by subsequent events.

Very little was done on the left wing. The only work of importance was a battery for twelve guns, which the Saxon Commander-in-Chief had caused to be thrown up at Hradek, overlooking the village of Lubno. So much time had been expended in the defences of Chlum and Lipa, which in addition to the more complete works above mentioned, had been strengthened by the usual measures adopted for the defence of villages, that the works round Problus were only commenced after the beginning of the action, and were confined to placing that village and Nieder Prim in a state of hasty defence, and in the construction of an abatis on the western flank of the wood between Problus and Charbusitz. Strange to say neither of the bridges at Nechanitz or Sadowa were blown up.

On the previous day a council of war had been held at the Austrian head-quarters, attended by the commanders of corps, and the chiefs of their respective staffs, who had assured the Field Marshal of the good spirit reigning in the Army, and of the readiness of all ranks to accept battle. Some changes had taken place among the superior officers since the commencement of the campaign. The Archduke Leopold had ceased to command the eighth corps since the 29th June; on the morning of the 3rd July, Count Clam Gallas, summoned by Imperial command to Vienna, resigned the command of the first corps; while the still more important posts of chief of the staff, and of the council of operations, held respectively by Baron Henickstein and Major-General von Krismanic, were vacated at the very moment of action, by the summary removal of the above-mentioned officers. The forces arrayed against each other on the day which was to decide the question of supremacy in Germany, may I think fairly be reckoned as follows:—

Austrian North Army, seven corps, and five divisions of cavalry, 184,000, and the Saxons 22,000 men, in all 206,000 men, with 700 guns, exclusive of train, but including the artillery.

The Prussian returns give the following numbers, which may be assumed to be correct:—

First Army, three corps, combatants of all ranks ..	84,830
Elbe Army, three divisions	39,088
Second Army, four corps	97,066
	220,984

with 780 guns.

To these may be added the reserve division of Landwehr of the guard, amounting to 9,200 men, which however, notwithstanding all exertions, only reached Nechanitz late on the evening of the day of battle, having marched since morning from Kopidlno.

In the first line stood the Saxons, tenth, third, fourth, and three brigades of the second Austrian corps, which may be reckoned as 117,500 men; in support three brigades of the eighth corps, Edelsheim's cavalry division, and the brigade Henriquez, 25,000 men; and in reserve the first and sixth corps, the second light and three reserve cavalry divisions, and the reserve artillery, 63,500 men.

I have already mentioned that it rained heavily on the evening of the 2nd, and during the greater part of the early morning of the 3rd of July. It rained heavily all that morning, till about 11 o'clock; the day remaining dark and gloomy till between 3 and 4, when it cleared up completely. So much rain had fallen as to add greatly, not only to the discomfort of the troops, but also to the difficulties of the march. A great part of the country was covered with standing corn of a luxuriant growth, which not only impeded the movements of the infantry, but, clustering round the fetlocks of the horses, and the spokes of the gun-wheels, rendered the advance of the cavalry and artillery one of the most difficult on record.

At an early hour of the morning, the whole of the first Prussian Army had taken up the positions allotted to the several corps and divisions. Prince Frederick Charles left Kamenetz soon after one o'clock for Milowitz, where shortly before six, an orderly Officer of General von Herwarth reported to him that the three divisions of the Elbe Army would reach Nechanitz successively in the interval between 7 and 9 o'clock. News from the Crown Prince could not be so soon expected, the more so that the orders for his advance had proceeded directly from the King, to whom, naturally, his acknowledgment of them would first be delivered. The Prince was, however, fully entitled to reckon on the assistance of the first corps, under General von Bonin, whose head-quarters were at Oper Praussnitz on the right bank of the Elbe, and the co-operation of the remainder of the second Army could, with certainty, be reckoned on at a later period. He was clearly of opinion that the circumstances justified an early attack by the first Army, so as to engage and hold fast the allies, to waste their strength, and ensure their annihilation.

At 6 A.M. he ordered a forward movement, which was carried out as follows:—

The eighth division advanced on and to the left of the high road

against Sadowa; the second corps to its right, against the villages below that point; while the seventh division received orders to debouch from Cerekwitz so soon as the troops directed against Sadowa had come into action. The fifth and sixth divisions followed the eighth in reserve; the reserve artillery was ordered to move by the great high road, and the cavalry corps, which had been advanced from Gutwasser to Petrowitz, was ordered to follow the right wing and secure the connection with the Elbe Army.

It was about 7 a.m., that the Austrian batteries, between Sadowa and Maslowed, first opened on the heads of the Prussian columns, though the advanced guard of the eighth division was already engaged in a sharp fire of musketry with the troops occupying the brick yard at Sadowa, while further to the right, partial affairs with the outposts, and the occasional fire of field guns, had for more than half an hour marked the commencement of the action.

The advanced guard of the Elbe Army reached Kobilitz at half-past 6, and found Alt Nechanitz occupied by a battalion of Saxon infantry, which retired on its supports after having set fire to the bridge over a millstream, and the neighbouring farm buildings. The troops at once pushed on to the attack of Nechanitz, while flank detachments sought passages through the marshy meadows, which made the Bistritz unpassable, both above and below the little town. The cavalry corps reached Petrowitz at the same hour, and by 8 o'clock was in an advantageous position at Sucha, between the Elbe and first armies, and fronting the Bistritz. Werder's division of the second corps reached the neighbourhood of Sawadilka soon after eight; Herwarth's division of the same corps, followed by the reserve artillery, marched across country towards Mzan, near which village the division formed for attack. The villages on the opposite side of the stream were fully occupied by the enemy, and 32 guns above Dohalicka opened heavily on the advancing columns.

Fransecky's division* reached Cerekwitz as early as 3 A.M. Its able commander at once took steps to notify the position of his troops to the outposts of the first division of the guard, which extended to Daubrowitz, and prepared to march as soon as the first shots in Sadowa should give him the signal for his advance.

No great resistance was made by the Austrian outposts; the position lay behind, and not on the Bistritz, the passage of which could only be effected at well-known points, which were amply covered by the artillery posted on the terraces of the southern bank, and by the possession of the woods of Sadowa, Lipa, and Maslowed, and the villages in their rear.

At 8 o'clock loud hurrahs from the Prussian reserves announced the arrival of the King, who at once proceeded to acquaint himself with the position of affairs, and, after consultation with Prince Frederick Charles, ordered a general advance of the first Army against the line of the Bistritz.

Nechanitz had about this time been occupied by the advanced guard

* 7th Division.

of the Elbe Army, under Major-General von Schöeler, and the Bistritz having been crossed above that point, but with great difficulty by two detached battalions, General von Herwarth at once pushed on to the attack of the Austro-Saxon position at Lubno and Hradek.

An attempt to cross the river at Steisskal* had failed. The bridge was broken down, and the dykes, swollen by the rain of the previous night, were unpassable by the lightest troops. It was only at Kuncitz that a second detachment, also composed of two battalions, succeeded in crossing, and was at once directed against the chateau and park of Hradek. Lubno had been carried after severe fighting, the Saxon detachments in Popowitz and Tresowitz were driven in, and at 11 o'clock nine battalions and twelve guns, with the hussar brigade and battery of horse artillery commanded by Major-General Count Goltz, were formed on the ridges extending from before Hradek to Lubno, for the attack of the main position of the Saxon corps which occupied the ground from Problus to New Prim.

In the meantime the battle had raged fiercely on the other flank. Lieutenant-General v. Fransecky, debouching from Cerekwitz, had occupied Benatek as a *point d'appui* for his advance on Cistowes and the wood of Maslowed. This was really the strongest point of the whole Austrian position. The wood of Maslowed,† sometimes called the Swip wood, or wood of Wobora, with a length from east to west of 2,000, and a depth of about 1,200 paces, domineers the whole ground, attaining at its highest point an altitude of 917 feet, 281 above the valley of the Bistritz, towards which on the north it presents a steep and overhanging face, furrowed by small ravines clothed with brushwood, the wood itself consisting partly of large trees, partly of oak-wood coppice. Forty guns, advantageously placed, swept the flanks of the ridge. To these the seventh division could oppose but eighteen, and those on ground, and at a distance, which rendered their fire almost nugatory.

The first success of the advanced guard, under Major-General v. Gordon, although eventually supported by the remainder of the division, only brought up still stronger Austrian reinforcements, until at 11 o'clock the whole of the fourth, and a considerable part of the second corps, were occupied in defending the ground they had won, preparatory to a still more energetic onslaught on the hard pressed Prussian division. As early as half-past 9 o'clock, six Prussian‡ found themselves opposed to 18 Austrian battalions of the third and fourth corps, supported by the remainder of the fourth, and the two battalions of the eighth corps, which had been left in Horinowes.

Between this hour and 11 o'clock reinforcements reached both sides, but although every battalion of the seventh division was successively thrown into the disputed wood, they were not only unable to improve their first success, but, decidedly overmatched, were forced back to its northern skirts. The losses were enormous on both sides; many

* Below Nechanitz.

† This wood was not marked on the Austrian map. Austrian writers call it the wood of Benatek.

‡ 3 of 27th Regiment; 2 of 66th Regiment; 1 of 67th Regiment.

of the mounted officers of Fransecky's division were killed, wounded, or had lost their horses; a small detachment of the twenty-seventh regiment had been cut off and taken prisoners; and the General himself, whose horse had been shot under him, having pressed forward under fire to examine the enemy's dispositions, was only saved from capture by a small party of his scattered men who had gathered to his rescue. Count Festetics had also been severely wounded by a shell splinter, which shattered his left foot, and had been carried off the field, the command of the fourth corps devolving on Major-General von Molinary, who was compelled towards 11 o'clock to request assistance from the second corps. Count Thun had already occupied ground at Horinowes with one brigade, and a great part of his artillery, and now hastened with the brigades Saffran and Würtemberg to support the fourth corps by a vigorous offensive movement against the left flank of the Prussians. The brigade Henriquez and the cavalry division of Count Taxis were left on the Trotina, but from his own statements, Count Thun appears to have been quite unconscious of the proximity of the second Prussian Army, and of the force which was so soon to be thrown on the inadequately protected flank. Fransecky had pushed his last battalion into the fight, had no expectation of any further assistance from the eighth division beyond two battalions, which had already reinforced him at Cistowes, and up to this time had heard nothing of the first corps, or of the advance of the second army. He had suffered enormous losses in officers and men, and with fourteen battalions, and twenty-four guns, found himself engaged with the greater part of two Austrian corps, and over a hundred guns, which hurled destruction into his ranks from every commanding position on his flanks and front.

I had seen the corps to which his division belongs at the previous autumn manœuvres near Merseburg. As regards *physique*, the men of the Saxon province are decidedly inferior to other corps of the Prussian Army, but as a highly disciplined and admirably-drilled body of men, they had commanded my warmest admiration. The results of this eventful day showed them to be possessed of the highest qualities of an efficient infantry, and that to the docile tractability and intelligence of the Saxon, were added the sturdy patience under fire, which we have always looked on as the peculiar characteristic of the English infantry soldier.

Here we must leave them, while we cast a glance at the centre, where the remainder of the first Army had worn out the long morning hours against the main Austrian position, fighting under the immediate observation of their much loved King. The passage of the Bistritz, which had been ordered immediately after the arrival of his Majesty on the field, was effected by an echelon movement from the left. On looking at the model, or at plans of the battle, it will be seen at once, how admirable a position for artillery is presented by an eminence called the Roskos Berg, to the south-west of the village of Sowetitz. As soon as this point and the wood of Skalka had been occupied by the sixteenth brigade, the fifteenth* received orders to

* 8th Division, 4th Corps.

seize the wood of Sadowa. This is a square of about 1,100 or 1,200 paces on each face, composed of high wood near the road, the remainder, of low, but thick brushwood. It was not held in any great force by the Austrians, who appear to have relied for its defence on the formidable artillery posted on the ridge extending from Lipa to Stresetitz, and which commanded the debouche from the wood. The fourth division moved forward from Mzan at about the same time, and was soon followed by the third from Sawadilka, in the direction of Johanneshof.

The gradual advance of the eighth and fourth, enabled Lieutenant-General von Werder, towards half-past 9 o'clock, to push the third division across the Bistritz, and attack the villages on the right bank. The sixth brigade, on the extreme right of the first Army, marched on Mokrowous and Dohalicka, while the fifth advanced over Kopanina. The defence of the Bistritz was by no means earnest; Mokrowous was carried at the first rush by a battalion of the fifty-fourth regiment, and at 11 o'clock the first Army stood on the line wood of Maslowed, wood of Sadowa, and Mokrowous, with the third corps in reserve between Ober Cernutek and the Roskos Hill, the reserve artillery on the high road between Dub and Sadowa, and with a part of the cavalry so near at hand as to be available in the event of a further advance. But it was plain that the real position lay behind the line of the Bistritz. Judiciously posted on the terraces which line the left bank of the river, and on the higher eminences which I have mentioned, the Austrians had not less than 250 guns in this part of the field, while the Prussian batteries not only suffered under the disadvantages inseparable from an advance under fire, but also from those caused by the difficult and marshy ground which limited the passage of the Bistritz to few and well marked points, and at this hour had but 72 guns to oppose to their well placed and admirably handled opponents.

Taking this as one of the best marked periods of the day,* the state of affairs may be briefly described as follows:—

On the Prussian right General von Herwarth stood prepared for an assault on the Saxon Army corps with so much of his force as he had been enabled to extricate from the narrow bridge and crowded town of Nechanitz, the line of Hradek-Lubno marking his position.

The Prussian centre had passed the Bistritz at several points, but though established in the valley was brought to a standstill by the nature of the ground and the Austrian fire.

To the left of the centre, the seventh division was exhausted by four hours of hard fighting, and every attempt to seize the wood of Maslowed was checked by a superior force, backed by an overwhelming artillery, which was then preparing for a renewed and more decisive attack on their weakened enemy.

As regards the Austrians they can be said with truth to have only now occupied their real position. All that had previously occurred might be designated as the preliminaries of the battle; their outposts had been driven in, but nowhere except at Maslowed had the infantry

* 11 o'clock.

been seriously engaged, and their losses up to this hour were probably unimportant. It does not appear that either Army had the intention to advance. Reinforcements to the Austrian batteries on the central slopes had already been asked for and refused, I believe, on the ground that a descent into the valley of the Bistritz was not contemplated, while the part to be played by the Army of Prince Frederick Charles was plainly to hold what he had, and await the arrival of the Crown Prince.

As I now propose to describe the advance of the second Army, I shall perhaps be better understood if I connect its movements in one continuous narrative, and endeavour to throw some light on events which to this hour are very imperfectly comprehended. The key to the mystery, which has been a puzzle even to military students of the campaign is the employment of so large a proportion of the Austrian Army in the operations at the wood of Maslowed, by the concentration of the fourth and of a great part of the third corps on this point, where they were held in check by fourteen battalions, far in advance of the ground on which they were intended by Field-Marshal Benedek to have been employed.

The orders despatched from Königinhof at 5 A.M. reached the Corps at hours varying with their remoteness from head-quarters. The sixth corps, which had been previously detailed for a reconnaissance on the right bank of the Elbe towards Josephstadt, was already in motion, and partially across the river at the time the order was received, a fortunate circumstance which greatly conduced to the success of the subsequent operations.

The fifth corps marched punctually at the interval* named from the departure of the sixth, and crossed the Elbe in the same direction. The Guard was nearest to head-quarters and was soon roused, while the reserve cavalry marched three-quarters of an hour after the receipt of the order at Neustadt.†

The advanced guard of the first corps lay at Chroustow, where the roar of cannon was distinctly audible, though strange to say no report had been made to the head-quarters of the corps. The order to march, which was despatched from Ober Prausnitz at 9 A.M., reached Chroustow at 9·20, and the vanguard at once commenced to move, but had not reached Gross Bürglitz at 11 o'clock. The advanced guard, followed by the reserve infantry and cavalry, was directed to move by Gross Trotin and Weiss Polikan, the main body of the corps, followed by the reserve artillery, by Zabres, Lanzow, and Sedletz.

The reserve cavalry of M. General von Hartmann, a son of Sir Julius Hartmann, who formerly served England with so much distinction, was impeded by the columns of the first corps. An attempt was made to march by Miletin, which also failed, and this important division of the second Army was reduced to a continuation of the march in rear of Bonin's troops.

Major-General von Alvensleben, who commanded the advanced

* Two hours.

† The order arrived at 8.15, the cavalry marched at 9 o'clock.

troops of the Guard at Daubrowitz and Liebthal, broke up soon after 8 o'clock, without having received the orders of his immediate Commanding Officer, in consequence of the urgent representations which had reached him from the seventh division, and marched in the direction of the now audible artillery fire in the Bistritz valley.

An Officer was sent to General von Fransecky to assure him of support, and that the troops would be at Jericek by half-past eleven, where, however, they arrived a full half hour earlier, owing to the eagerness with which the men pressed forward.

The Crown Prince, having seen the greater part of the first division of the guard pass through the town, left Königinhof soon after 8 A.M., and passing the leading battalions on their march across the plain of Daubrowitz, reached a spur of the plateau south of the village of Chotieborek soon after ten o'clock.

Little or nothing was to be seen of the progress of the battle. The view was obscured by a thick pall of fog, by the smoke of burning villages, and of the furious cannonade which was now raging between Benatek and Maslowed, and was further shut out by a bend in the valley of the Bistritz, which hid all but the mere flank of the contending forces.

Due south of the spot on which the Prince was standing, and at a distance of about three English miles across the tract of low ground lying between the Bistritz and Trotina, the high ground behind the village of Horinowes was crowned by a prominent object. Two lime trees and a tottering cross mark the site on which tradition relates that, during the Hussite persecutions, a devoted band of Bohemian Protestants met the fate which their so-called heresy had brought upon them, and sealed their fidelity with their life-blood.*

The fog had somewhat lifted, and the difficulties attending the slow advance of the troops, by miry roads, or through standing corn, afforded the Prince and his staff full time for consideration.

Certain movements of the enemy near the trees, and the partial view which was now obtained of the struggle at Maslowed, led to the conclusion that an advance in their direction would bring the second Army into the flank, nay, possibly, into the rear, of the Austrian position, and orders to that effect were immediately issued. Reports from General von Mutius, and from the fifth corps, informed him that the former had reached Welchow, and was pressing onwards in the right direction; while at 11 o'clock, the leading brigade of the latter, under Major-General von Wnuck, had already shown itself immediately in his rear at the village of Chotieborek. The first corps was known to be on the march for Gross Bürglitz, and the Guard under Prince Augustus of Würtemberg, were defiling past the ground on which he stood, and answering his words of encouragement with cheers of anticipated triumph. I was much struck with the cheeriness with which these young soldiers went into action for the second time. All *recruits*

* This tradition rests on fact, and was told to Prince Pless by an intelligent citizen of Horitz, as a well known fact, when visiting the battle-fields in the summer of 1867.

fight well in their first battle; those who afterwards brave death and wounds with cheerfulness are *soldiers*.

The first troops under fire, were the leading files of the eleventh division under Lieutenant-General von Zastrow on their reaching the high ground north of Racitz, near the point where the brook Trotinka loses course and name in the small river Trotina, and from whence their combined waters flow into the Elbe, through a broken and difficult valley, near the village of the same name. The foremost batteries of the division crossed the bridge at Luzan, and advanced to Racitz, where they opened fire at half-past 11 o'clock against the heights of Horinowes; while as nearly as possible at the same time, two batteries of the Guard came into action near the villages of Zelkowitz and Wrchownitz. The early morning orders of the Crown Prince had concentrated his Army, the flanks of which were then separated by an interval of nearly twenty miles, on a front of between eight and nine, extending from Bürglitz over Jericek and Chotieborek to before Welchow, while the advanced guards were fighting on a still more advanced and narrower front between Zelkowitz and Racitz. From this hour till nearly 4 o'clock, the sixth corps, under its much-lamented commander,—who survived the honours won for him on this day by the brave Silesians, to die of fever, two months later, on the plains of Austerlitz,—pursued an almost independent course, thoroughly in accord with the general direction of the second Army, and the plans of the Crown Prince, but at the same time so far removed, and so concealed by the undulations of the ground, that it appeared at the time like a separate battle.

With the exception of the brigade Henriquez, and of two battalions of the brigade Thom, the whole of the third Austrian corps had been drawn into the fight at the wood of Maslowed, and Major-General Henriquez was in the act of breaking up from his position near the Elbe, to march to Sendrasitz, when he was made aware that the enemy's columns were already in the neighbourhood of the Trotina valley, and were advancing on Racitz. The movement, which had already commenced, was at once countermanded, and the Major-General prepared for a resolute defence of the position.

Racitz, however, was carried by a battalion of the 50th regiment, and leaving Horinowes on his right hand, Lieutenant-General von Zastrow established himself, soon after midday, on the high ground between that village and Sendrasitz. Further to the left, Lieutenant-General von Prondzynski, with the seven battalions to which his division was reduced by the absence of two regiments in Prussian Silesia, had carried the hill of Horicka, and passed the Trotina in immediate contiguity with the left of the eleventh division.

At 12 o'clock the second Prussian Army had attained the following position:—

The detachment of the Guard, commanded by General von Alvensleben,* was advancing from Wrchownitz against Horinowes. The head of the eleventh division had carried Racitz. The twelfth division

* 4 battalions, 2 companies, 2 squadrons, 2 batteries.

was advancing from the Horicka Berg to pass the lower Trotina. The two corps had 48 guns in action.

Warned by a telegram from Josephstadt, and by the reports of Henriquez, that at least one Prussian corps was moving against his right flank, Field-Marshal Benedek had forwarded an unmistakable order to Count Thun, not only to abstain from any further advance against the wood of Maslowed, but to take up the position originally assigned to him for the defence of the right flank. To cover this change of position (right thrown back), five batteries were ordered to the heights east of Horinowics, the brigades Würtemberg and Saffran gradually drew back towards the village of Nedelist, and the brigade Thom took up a defensive position on the ridge which extends from Maslowed in the direction of Sendrasitz. Between 12 and 1 o'clock, four of the reserve batteries of the guard reached Jericek after a fatiguing, but most creditable march. Prince Hohenlohe, their commander, had conducted them with persevering energy through the tangled columns which were streaming across the narrow valley of the Elbe up the single road which led to Daubrowitz, and now brought seasonable relief to the twelve guns which had for so long maintained an unequal combat with the batteries at Horinowes. A further reinforcement was afforded by the arrival of two more batteries from the first division,* and of a battery of horse artillery, so that before 1 o'clock, 90 guns of the second Army were in action, under cover of which the advance to the plateau of Horinowics was successfully carried out. Notwithstanding the repulse of two charges of the Prussian cavalry on Austrian infantry columns near Horinowes, the infantry made steady progress, and the first division of the Guard established itself on the plateau simultaneously with the arrival of the eleventh division on the ridge north-east of Sendrasitz, and the passage of the Trotina by the twelfth.

Towards two o'clock, General von Hiller at the head of the first division of the Guard,† reached Maslowed, which had already been occupied by a battalion of the second regiment of the Guard, under Major von Petery, left the village to his right, and continued his march in the direction of Chlum; Zastrow was in full possession of Sendrasitz; and the twelfth division, which had crossed the river at the mill and village of Trotina, was pressing back the black and yellow brigade towards Lochenitz. The second, and certainly a part also of the fourth Austrian corps were at this time in the act of withdrawal, but, with the exception of unimportant detachments, the columns do not appear to have come in collision with Hiller's division, although they directly crossed his path. Field-Marshal Benedek is also reported to have ridden towards Sweti, without, however, having been made aware of the serious danger which was threatening his right wing. Although the reserve corps were warned that a change of front might be found necessary, they still remained in the position occupied by them since the commencement of the battle. The reserve artillery, on the contrary, had not

* Of the Guard.

† 1st, 2nd, 3rd, Fusiliers, Hussars, Rifles—of the Guard.

been idle. A part of it was employed in reinforcing and replacing batteries which had been so long engaged in the centre, and eight batteries were deployed on the high ground to the west of Nedelist where, in combination with forty guns of the fourth corps, they covered the movements of the two corps.

We left General von Hiller on the slope between Maslowed and Chlum, and as the second Austrian corps had at this time passed the ground over which the division was marching, and the fourth corps partially, the feeling between these corps and the third was completely lost, and the division marched through the gap. Leaving Maslowed a thousand paces to its right, the main body of the division marched directly on the church steeple of Chlum. The resistance encountered, except from the artillery, was at first by no means serious. At the field work No. 3 fourteen guns were captured by detachments of the second regiment, and of the rifles of the Guard, the former under a young Lieutenant named Chorus, who earned the order of merit by his gallantry. Two more were taken between the work and Chlum, and six near the field work No. 4, all in the first rush, while of the last-named battery a seventh gun was captured, after personal encounter with its defenders, by Colonel von Krosigk of the Hussars of the Guard, whose regiment was broken up into squadrons, and who had, therefore, remained with the divisional commander.

Excepting by the artillery not a shot was fired from the village till the assailants were close at hand; the only infantry encountered on the march, were two battalions of the fourth corps near field work No. 3, and Chlum was at once attacked on the east and south faces by the first battalion of the first regiment of the guard, while a company of rifles forced its way through the northern outlet. Chlum appears to have been garrisoned by the Brigade Appiano of the third corps. Two battalions of the regiment No. 46 (Saxe Meiningen) were in the village, the remaining battalion and the fourth rifles to the south-west on open ground, while the sixty-second regiment (Archduke Henry) extended nearly to Langenhof. It is plain that the attention of the brigade was directed to the movements of the first Prussian Army, and that the attack of the guard was a complete surprise. The troops which first reached the opposite sides of the village were overwhelmed with grape from a battery of the third corps; this was, however, carried after a heroic defence with the loss of seven guns and of more than half its men and horses. At a quarter to 3 o'clock, Chlum was in the hands of General von Hiller, and his battalions of the left wing were pushing on to the attack of Rosberitz. This was in the first instance as successful as that on Chlum, but Rosberitz was close to the position occupied by the Austrian reserves, and the struggle for possession of this village was destined to be only less memorable than that in the wood of Maslowed. The attacking troops consisted of the second battalion of the first, the Fusilier battalion of the second Foot Guards, and the third battalion of the Fusilier Guards, with two companies detached from other battalions of Hiller's division.

It will be remembered that part of the Austrian reserve artillery had been brought forward to cover the withdrawal of the second and fourth

corps. The steady advance of Hiller and Zastrow had for result the retirement of these guns, a movement which probably commenced with the right, as Major von Erckert, with the fusilier battalion of the second Foot Guards, fell in with the left battery in the act of retiring towards Wsestar, and while the escort was dispersed by one of his companies, pressed with his Adjutant and a few men into the middle of the battery, and captured two guns. The battalion continued its advance on the village, and was posted in the houses of the straggling street, the southern extremity of which abuts on the high road.

If the advance of the second Army may, and I think aptly, be likened to a wedge driven into a resisting mass, the detachment at Rosberitz may fairly be called the point of the wedge.

Here we must leave it for a while in its perilous position, while we cast a glance at the occurrences on both flanks. During the advance on Chlum, Major-General von Alvensleben, with the original advanced guard, had reached the valley lying between Maslowed and Chlum, when he suddenly became aware of columns of infantry debouching on his flank, from the direction of Lipa and Cistowes, accompanied by cavalry, and by a battery of artillery. It was the brigade Fleischacker, with a regiment of Hussars, and a 4-pounder battery which had been left in Cistowes on the retirement of the fourth corps, and was now moving on Nedelist. A scene of the wildest confusion ensued. The Hussars first lit on two companies of Engineers and two of the reserve batteries of the Guard near fieldwork No. 3, and a little further on the reserve battery of the first division, and were obliged to retire with severe loss. Accompanied by the 4-pounder battery they attempted to pass Chlum, but were received by a sharp fire from a company of rifles, and were driven in the direction of Maslowed. Here they were again received with fire from the infantry in the village, and from a battery of the Guard, and lost two guns, while those who succeeded in breaking through were shot down almost to a man, as they were careering madly down the hill in the direction of the Crown Prince and his staff, who were eye witnesses of this extraordinary episode of the fight. The remainder of the battery fell in with three detached companies of the guard near the village, and lost four guns, a part of the Hussars actually retiring towards Bürglitz. The main body of the brigade came into collision with General von Alvensleben's detachment of three battalions and a company of rifles, and were compelled to retire into the wood from whence they had originally issued, with the loss of their two remaining guns. Under the personal direction of Lieutenant-General von Hiller, Alvensleben continued his march on Chlum, where his support was most urgently required.

On the other flank Prince Hohenlohe had advanced with the reserve artillery of the guard, and occupied the ground between Chlum and Nedelist, from which the Austrian artillery had been compelled to retire by the advance of the Prussian infantry. Here he received orders from General von Colomier (commanding the artillery of the Guard), to move on Chlum, and at once took the direction of the heights south of that village. Still further to the left were four companies of

the third regiment of the Guard, in the direction of Sweti. Before returning to the centre of the battle, I will beg you to follow briefly the eleventh and twelfth divisions in their successful progress against the extreme right of the Austrian position.

The occupation of Horinowes, by the Guard, and of Sendrasitz by his main column, enabled Lieutenant-General von Zastrow to push his advanced troops against Nedelist, which was successfully carried by assault, almost simultaneously with the advance on Chlum. During the advance, the skirmishers of a battalion of the 50th Regiment, under Major von Berken, came suddenly in the high corn on the right of that long line of artillery which had played with so much effect on the advancing Prussians, and captured ten guns in fair fight, besides three which they found abandoned on the ground. The remainder of the brigade had been held fast at Sendrasitz, by the cross fire from these batteries, and from that of the brigade Henriquez, south of Trotina, and having been compelled to take shelter from the storm of missiles behind the houses, and in the hollow ways north of the village, they did not reach Nedelist till nearly half an hour later. About the same time,—which must have been three o'clock, or soon afterwards,—the arrival of the twenty-second brigade of the 8th Dragoons and 4th Hussars, and of the divisional artillery, enabled Zastrow to concentrate the whole of his division for a further advance. The twelfth division had also crossed the Trotina at the mill and railway embankment, and the two regiments of which it was composed, after making numerous prisoners in the hut-camp north of Lochenitz, had made every preparation for the attack of that place, when they were directed by the Corps Commander to hold themselves in reserve for other operations. At three o'clock the Austrian right wing, comprising the second and fourth corps, and a division of cavalry, were in full retreat on Lochenitz, Predmeritz, Wsestar, and Sweti, while the five Prussian brigades which had so fortunately achieved this success, were established on the line Chlum, Nedelist, Lochenitz, with the point of the wedge at Rosberitz, and with a reinforcement of ten untouched brigades, which were rapidly coming up in support of their somewhat perilous position. Fifty-five guns were already in their hands, and the most advanced troops commanded the great high road from Sadowa to Königgrätz. But at a distance of 2,000 paces were two unbroken corps, with a numerous artillery, massed in the hollow between Sweti, Wsestar, and Rosnitz, while three of the five cavalry divisions were immediately available. The only certain support on which Hiller could reckon, were the leading battalions of the second division of the Guard, the main body of which was still behind Maslowed; the eleventh division was at Nedelist, the fifth corps was then mounting the hill of Horinowes, and the First corps was still on the march between Wrchownitz and Benatek.

To the last-mentioned part of the field where we left Fransecky and his Saxons struggling for a foothold in the wood of Maslowed, I must now ask you to return.

Soon after eleven o'clock, a succession of furious attacks was made by the second and fourth corps on the exhausted troops, which indeed

were partially successful. Those of the fourth corps were chiefly directed against the eastern and southern, while the second corps attacked the northern side of the wood, and more particularly the strip of ground which extends like an outwork in the direction of the road from Benatek to Maslowed. The battalions, nay even the companies, were broken up; the Prussians were pressed back on both flanks, which were separated from the centre; detached parties of the second corps emerged from the north-western angle of the wood and moved on Benatek; while a renewed effort of the fourth corps from the south, and of detachments of the brigades Würtemberg and Saffran, supported by five of Thom's battalions, had for its object the capture of the Prussian stronghold, the extreme northern point of this memorable wood. But Fransecky was equal to his post, and nobly was he seconded by the Officers and men of his ever-glorious division. A Staff Officer* had also arrived from the Crown Prince with news of the second Army,—in truth still distant from the field, and embarrassed with the difficulties of a wearisome march,—still, the relief was certain, and the cry of "the Crown Prince is coming" lent new courage to the hard-pressed band.

Singular to relate, the seventh division had been all this time making prisoners, and each time that they were driven back, had carried with them the trophies of their obstinacy in numbers which almost equalled those of their own killed and wounded.† Personal direction was never wanting, and in Major-General von Schwarzhoff, and in the two Colonels, von Medem and von Blankensee, Fransecky found able and undaunted assistants. At length, between 1 and 2 o'clock an abatement in the vigour of the Austrians became perceptible, but although the corps withdrew gradually from the conflict, detachments were still left fighting in the wood, where they kept up the struggle till between 2 and 3 o'clock. During all this time the troops in Cistowes had held their ground while the hostile batteries both in front and rear, kept up the unceasing duel over their heads, until at length they were relieved by the advance of the second army. The efforts of the Austrian infantry had been most gallant and persevering, but they shattered on the unconquerable obstinacy and endurance of the more northern race. The losses of the seventh division were enormous. The 12 battalions had 84 officers, and 2,036 men *hors de combat;* of which the twenty-sixth regiment alone lost 26 officers and 709 men (a full fourth of its strength), and the two battalions of the eighth division, which fought on the right with Major-General von Gordon had 5 officers and 126 men killed and wounded; 2,000 prisoners and three colours were the trophies of this ever-memorable combat.

Towards twelve o'clock, Prince Frederick Charles, who had exercised

* Major v. der Burg.

† A battalion of the 51st Austrian Infantry which emerged from the north-west corner of the wood, so completely lost its direction that, whilst marching in loose order, it was attacked by a squadron of the 10th Prussian Hussars, under Captain von Humbert, and 16 Officers and 665 men were the results of this fortunate encounter.

a commendable prudence in resisting all suggestions for an advance beyond the Bistritz, a movement which would in all probability have resulted disastrously to the Prussian arms, thought the moment had arrived which justified the employment of his reserve. The fifth division passed the brook at Unter Dohalitz, and deployed to the right; the sixth crossed at and alongside the bridge at Sadowa, and massed itself behind the wood.

But even now the moment of advance had not arrived; all that the Prince could do was to hold the centre, and await the action of the two armies on his flanks. Nor was this to be effected without difficulty. A long period of anxious suspense had still to intervene, and the heights of Chlum and Lipa, and the wood of Sadowa were destined to be strewn with bloody witnesses of the struggle for their possession. Here the battle presented the aspect of a great artillery duel. The ground on both banks of the Bistritz was admirably adapted for the development of this arm, more particularly on the eastern or Austrian bank. Their artillery was ranged on terraces which gave them almost absolute command of the valley, and was worked with a precision and energy which foiled every attempt of the first army to advance beyond its position in the villages and meadows on the Bistritz. Towards midday the exhausted batteries of the third and tenth Austrian corps were relieved by a part of the reserve artillery,* and not less than 200 Austrian guns were simultaneously in activity on this part of the field. The Prussions laboured under one great disadvantage, I mean the large proportion of their smooth-bore guns,† which in a game of long bowls were virtually useless. It was an anxious time. News of the Crown Prince was still wanting, nor were affairs in the extreme right so far advanced, as to exercise any influence on the movements of the centre. I think great credit is due to the Prince for the cool determination with which a man of his eager and impulsive temperament played so steady a waiting game, and kept his troops so thoroughly in hand, while history will no less do justice to the bold conception, and to the untiring energy with which the Crown Prince brought his army to the very point where its action was so triumphantly decisive.

Both showed qualities widely differing from their accepted characters and dispositions, proved themselves true servants of their King and country, and soldiers of whose deeds any nation may be proud.

But if the Prussians were held fast in the position which they had won, the Austrians were equally inhibited from an advance; while after midday the perilous condition of their right flank still further forbade so hazardous an adventure.

The artillery of the second and third corps in the Prussian centre was gradually strengthened by reinforcements from the reserve, batteries which had exhausted their ammunition were replaced by others from the same source, and the duel assumed more equal proportions. But part of this was divisional, part reserve artillery; unity of command was wanting, and much ammunition was expended without any

* Said to have been 8 batteries, 64 guns.

† 36 to each corps, more than ½, in fact, ⅔ of the total number.

corresponding result. Nor was this expenditure easily replaced. The batteries had but infrequent and difficult communication with the ammunition columns. The Bistritz has few bridges, and still fewer fords, and to the disconnected action of the Prussian artillery in this part of the field was added a deficiency of ammunition which rendered the batteries partially ineffective.

The infantry of the eighth division had submitted with patience to an ordeal scarcely less trying than that of the seventh. The great importance of the Wood of Sadowa had demanded its occupation in such force as to absorb the greater part of the division, which had even been re-inforced by a detachment from the fourth, furnished by the brigade of Major-General von Hanneken.

Detachments of the sixty-first and seventy-first regiments which had established themselves in a deserted Austrian camp, and thence attempted a forward movement, were compelled to retire to the wood, and the unremitting artillery fire, which always produces a depressing influence on stationary troops, had caused serious losses to the division. Between one and two o'clock, the brigade Kirchberg of the third Austrian corps was directed by the Archduke Ernest to attempt the recapture of the wood. The attack produced no other result than that of concentrating the scattered detachments in its front, and of causing further losses on both sides. A like attempt on the part of the fourth Prussian division was frustrated by the fire of the artillery on the heights. In fact it was very like a drawn battle on this part of the field, and it may easily be imagined with how great a feeling of relief the first detachments of the Guard were observed on the hill of Chlum towards three o'clock, while it became known that the whole second army was marching to the assistance of their hard-pressed comrades.

We left the Elbe army at 11 o'clock defiling through Nechanitz under cover of the vigorous action of its advanced guard under Major-General von Schöeler. At that hour the Saxon corps had taken up a position at Problus, and awaited attack, while thanks to the facilities afforded by the neglect to defend Nechanitz and Hradek, the Prussians had seized the height of Lubno, and had deployed their batteries as a cover to the operations against the main position. The Crown Prince of Saxony, who, no less than his brave comrades, displayed qualities which won universal admiration from their opponents (and I well remember the terms of respect in which the Prussians always named both the commander and his troops), had posted his forces as follows:—

The second division, Lieutenant-General von Stieglitz, stood in a covered position behind Problus, the brigade of the body guard on the right, the first brigade on the left; the cavalry of the division maintaining the connection with the tenth Austrian corps. The second brigade, having retired from the advanced position at Lubno, Popowitz, Tresowitz, stood in reserve between Problus and Stresetitz, and the third brigade, also part of the first division, stood with three battalions in Problus. Nieder Prim was occupied by the remaining two battalions of this brigade, and by the fourth rifle battalion, of the second

division. The reserve artillery was massed in a hollow behind the first division, close to the wood which lies between Problus and Charbusitz, and the cavalry division to the left rear, also near the western skirt of this wood.

The eighth Austrian corps, as already mentioned, stood in immediate support to the Saxons, near Bor, but the two divisional 8-pounder batteries were sent forward at an early period, as a re-inforcement to the 18 Saxon guns on the ridge. The 12 guns of the Prussian advanced guard were also re-inforced by two batteries of the fifteenth division, but a glance at the plan will show that the distance (4,000 paces) at which this artillery duel commenced, rendered its effects nearly nugatory. Both lines fired at a high elevation, the shells buried themselves in the ground, and exploded innocuously.

The Saxon position was attacked on both flanks. The fifteenth division, followed by the cavalry brigade of Count Goltz, took the direction of Hradek, for the purpose of turning the position at Ober Prim; the fourteenth division (which at half-past 11 o'clock was still behind Nechanitz) received orders to march on Popowitz, and attack Problus. A reserve cavalry brigade and the sixteenth division could only be available at a much later period. The wood between Popowitz and Problus was soon occupied by a part of General Schöeler's detachment,* too weak to undertake any further enterprise, but still serving admirably as a pioneer to the subsequent advance of the fourteenth division. The two battalions which had formed the right wing of the advanced guard, and had crossed the river at Kuncitz, marched on Sterizek, the centre attacked Neu Prim, and General von Schöeler sent a part of the 40th regiment to seize the Pheasantry, in the hope that his sharpshooters might thence succeed in dislodging the hostile artillery. These scattered movements, with weak forces, did not escape the Crown Prince of Saxony, who by a vigorous attack threw back the nearest Prussian battalions on Jehlitz and Hradek, and prepared to follow up his first advantage by an energetic offensive. But the movement on Sterizek not only threatened his flank, but had alarmed the eighth corps, and, notwithstanding partial and, indeed, not unimportant successes of their opponents, the Prussians eventually succeeded in holding the position they had seized. After severe fighting, during which the Austrian brigade, Schulz, was driven back in some confusion on the Saxon line, the Prussians were firmly and advantageously established. The 68th Prussian regiment, led personally by Colonel von Gayl, its commander, who put himself at the head of the fusilier battalion, particularly distinguished itself. The first advantage gained by the Austrian brigade was not only neutralized by the determination with which this battalion threw itself on the enemy, but the remaining battalions were enabled to debouch from the wood, to deploy on its right and left, and to effect the object of establishing the Prussian line from Sterizek to Neu Prim, and of connecting Major-General von Stückradt's detachment in the latter

* It will be remembered that this advanced guard consisted of a centre and two wings, and was of considerable strength. This was the detachment which crossed the Bistritz, *above* Nechanitz, 2 companies 28th Regiment, 1 battalion 17th Regiment, Rifle Battalion No. 8.

village with the adventurous right wing of the advanced guard. Neu Prim was occupied by the Prussians, and a second attempt to dispossess them resulted in the Austrian brigade being driven back on Problus and the wood of Bor. Major-General Schulz was killed, and 1,000 prisoners fell into the hands of the captors. Both sides now prepared for a further and more embittered struggle. The threatened flank of the Saxon corps was strengthened by the first brigade, which took up a position between Problus and Charbusitz, behind which the remains of the brigade Schulz were gathered in support, the artillery was re-inforced, and the two brigades of Saxon cavalry, with a battery of horse artillery, joined Edelsheim's cavalry division with the view of operating on the right flank and rear of the Prussians between Techlowitz and Radikowitz. The Prussians also gathered their forces for the attack, and exertions were made to supply the deficiency under which Lieutenant-General von Canstein* had hitherto laboured from the late arrival of the artillery. The batteries on the high ground at Lubno were pushed forward to within two thousand paces of Nieder Prim, and paved the way for the attack on that village. Bit by bit, its defenders were driven back, and, at about half-past 1 o'clock, the fourteenth division had disengaged itself from the defile of Nechanitz, and was formed behind the ridge at Lubno for the attack of Problus, for which both divisions were in perfect readiness at half-past 2.

The Crown Prince of Saxony, threatened by the steady advance of the division, Canstein, on his left, and by the appearance of Münster's division in his front, aware also, from his commanding position, of the arrival of the second Prussian Army, of the combat which was raging, in and about Chlum, and of the movements of the tenth Austrian corps under Gablenz, appears to have made preparations for retreat simultaneously with the contemplated advance of the Elbe Army. Reinforced by the arrival of their artillery, encouraged by the example of their Generals and Commanding Officers, and by the inspiriting strains of their regimental bands, the two divisions carried their concentric movement to a successful issue, and soon after three o'clock the Prussian right wing had full possession of the heights, and threatened the retreat of the left wing of the combined Saxon and Austrian Armies.

But the Saxons had fought well and obstinately, retreated in admirable order, and earned a respect which their adversaries were most ready in acknowledging and expressing.

About this time General von Herwarth, who had taken personal share in the attack on Problus, received the following memorandum from General von Moltke:—

"Crown Prince at Zizelowes.† Retreat of the Austrians cut off from "Josephstadt. It is of the greatest importance that General von Her- "warth should push forward on the opposite flank, as the Austrians "still hold their ground in the centre.

"At Sadowa, 1¾ o'clock.

(Signed) "VON MOLTKE."

* Commanding 15th division.

† This can only have referred to the 1st Corps, which was the only part of the 2nd Army whose arrival was likely to be observed from Sadowa.

The Elbe Army had fulfilled the arduous undertaking of marching fifteen miles from its bivouacs, over roads which increased the difficulties of the advance, and through so narrow and tortuous a defile at the town of Nechanitz, that the sixteenth division and five batteries of the reserve artillery only struggled through after seven weary hours of delay.

Herwarth's success was not obtained without severe loss. The 68th regiment lost 4 Officers and 140 men in the fight at Ober Prim; the fusilier battalion of the 56th regiment, 12 Officers and 200 men; while the four battalions of the 27th brigade had 4 Officers and 67 men killed outright, 17 Officers and 300 men wounded in the attack of the position at Problus. The Saxons still held the wood to the east of Problus, which was only taken after a renewal of the combat by the 28th brigade and a detachment from the fifteenth division, when the Saxons and the remnants of Schulz's brigade took post near Rosnitz, on one side of the wood, and the brigades, Roth and Wöber,* established themselves under cover of the further side of the wood near Charbusitz. An attempt was made to re-capture Problus. Stresetitz was still occupied by the Austrian artillery, and under cover of its fire, the brigade Piret of the first corps, which was detached for this purpose, advanced against the village, while Schwarzkoppen's brigade was in the act of assembly. The skirts of the village at first succumbed to this attack, only to make the repulse more decisive, and, at 4 o'clock, General von Herwarth was so far relieved from the enemy in his front, that he was enabled to direct his attention to the assembly of the fourteenth and fifteenth divisions; the 27th brigade in Problus; the 28th in the western skirts of the wood and at the farm of Bor; while Lieutenant-General von Canstein collected nine battalions in a position to the right front of the fourteenth division. Problus was burning furiously, but was occupied by its captors notwithstanding the fire still directed against it from the batteries of artillery near Stresetitz.

We left the guard at three o'clock, in full possession of Chlum and Rosberitz, but standing almost unsupported in face of a reserve of two corps of infantry and of seventy squadrons of the highly disciplined cavalry, of which Austria was with justice so proud. It was only now that Field-Marshal Benedek became aware of the advent of the second Army. On riding towards Chlum, he was received with a fire of musketry, which wounded several members of his staff and escort, among them Count Grünne, one of his Aides-de-Camp, and he learnt about the same time that Rosberitz had fallen into the hands of the enemy. A brigade of the first corps was despatched to the assistance of the Saxons, and the Field Marshal directed his attention to the recovery of the strongholds which had been so unaccountably lost. It was at about the same time that the Prussian head-quarters became aware of the more favourable aspect of affairs which now presented itself. The flashes from the guns of the second Army had been observed from the Roskos Berg, and the columns had been seen in movement on the slope of Horinowics, but what brought the greatest certainty to the Prussian

* 8th Austrian Corps.

staff was the gradual cessation of the assaults in the wood of Maslowed, and a visible abatement of the artillery fire along the whole of the line. With unimportant exceptions, the Austrian infantry was concealed behind the ridges, but the gradual slackening of the artillery fire, without any corresponding movement of the infantry in advance, led irresistibly to the conclusion that the latter was preparing to retreat, and at half-past 3 o'clock the King gave orders for the advance of the first Army.

It may give an idea of the extraordinary confusion of the integral parts of the Armies, when I mention that the wood at Lipa was still held by a brigade of the third Austrian corps, and by detachments of the fourth, which not only kept up a vigorous fire on the west of Chlum, but made preparations for the assault of the village, while another detachment of the fourth corps still had possession of a part of Cistowes. Cistowes was captured by the Guard, and by detached parties of the seventh division, but not till after the wood of Lipa had fallen into the hands of the Prussians, having succumbed to a combined attack from all sides under the direction of Major-General von Alvensleben. Its defenders drew off towards Lipa and Langenhof, leaving 1,600 prisoners behind them, but carrying off their wounded Commander, Colonel von Benedek. Scarcely had the wood been carried by the Prussians, when Austrian columns were perceived in full march against the heights of Chlum. Apparently a whole brigade, they crossed the high road between Rosberitz and Lipa,* unchecked by the Prussian fire from Rosberitz, and climbed the hill with a gallantry which only resulted in a fearful loss. The Prussian infantry detachments of the Guard reserved their fire till the leading files were within a hundred yards of the weak line of less than five companies.† Two well directed vollies and a withering file fire from the destructive needle-gun brought the columns to a halt, and finally drove them across the high road in the direction of Langenhof. The third Austrian corps, which had fought with great resolution under the Archduke Ernest, was completely broken up: the brigade Appiano had been defeated at Chlum; another, in the unfortunate attempt to retake the wood of Sadowa; the brigade Benedek in the wood of Lipa; and the brigade Prohazka, which stood in reserve at Langenhof, had already commenced its retreat. The artillery of the corps still held the position which it had taken at the commencement of the battle, and notwithstanding the withdrawal of the infantry, kept up a vigorous fire against the first Prussian Army. But, however successful on the right, the Prussian Guard was destined to a reverse on the left, resulting, after a stern and gallant resistance, in the recapture of Rosberitz by the Austrian reserves.

* From a statement in the January number of Streffleur's Military Journal, it appears that Gondrecourt attacked Chlum and Rosberitz with the brigades Ringelsheim, Poschacker, and Leiningen, of the 1st Corps, at about the time when Piret was detached to the assistance of the Saxons, while the brigade Abele was moved to Langenhof.

† 1st, 4th, and part of 7th Company of 2nd Regiment; 3rd and a sub-division of the Fusiliers; half a company of 1st Regiment and a sub-division of 3rd company 2nd Regiment as reserve.

The garrison which defended this important post, composed of the Fusilier battalion of the 2nd Guards, under Major von Erckert, occupied the southern skirts of the village with three companies, the fourth being posted with the third battalion of the Fusilier Guards under Major Count Waldersee on the western, while a battalion of the first regiment of the Guard under Lieutenant-Colonel von Block, held the eastern side of the village. Three companies of the 1st and 3rd Guards, which had become detached from the main body of the division during the advance on Chlum, joined the defenders of the village, and proved a seasonable reinforcement. More than 100 Austrian guns, a great part of which were deployed in a half circle between Wsestar and Langenhof covering the movements of the reserve, overwhelmed the village and its approaches with a shower of missiles of every description, and (for a time) effectually delayed the co-operation of the Prussian artillery.

Four separate attacks on the west of Rosberitz failed under the fire of its defenders, and at about half-past three the divisional artillery established itself on the hill of Chlum. Prince Hohenlohe had also succeeded, after two checks in his wearisome march, in bringing up the reserve artillery of the guard to a favourable position on the ridge; that of the sixth corps had also pushed forward from Nedelist, and fired on the flank of the Austrian line, the Guard artillery directing its fire mainly on the now plainly visible columns of the reserve. But this was not effected without important losses—one battery was silenced, and was compelled to withdraw from its position.

Warned by the failures on the west of Rosberitz, three massive columns, supposed to have been detached from the sixth corps,* were now launched against the southern and projecting end of the village, which was attacked simultaneously on both sides by an overwhelming force. The companies under Erckert were already reduced to half their original numbers, and had exhausted their ammunition in an unceasing exchange of shots with the Austrian riflemen in their front, Erckert fell dangerously wounded from his horse, and the remnant of his battalion was at length driven into the interior of the village, leaving their brave Commander in the hands of the enemy. A still fiercer combat succeeded in the interior of the village. The struggle was continued at duelling distance, Lieutenant-Colonel von Heldorf of the First Guards fell dead, Prince Anton of Hohenzollern was dangerously wounded, and notwithstanding all efforts of Count Waldersee, and of the brave fellows under his command, the Prussians were eventually driven out, with the loss of considerable numbers in killed and wounded, and of 70 prisoners.

Colonel von Obernitz, commanding the brigade, had been wounded in the head at the commencement of the first attack on Rosberitz, and the colour of Erckert's battalion was only saved from capture by the exertions of its bearer, Serjeant Gursch, and of three young Officers who came to his rescue.

The captors of Rosberitz endeavoured to debouch from the village,

* More probably 1st, see note above.

but in vain. The fire of infantry and artillery on the plateau of Chlum drove them back with fearful losses, a battery showered canister on their flank, and they were compelled to retire again to the village, leaving the slopes of Chlum strewn with killed and wounded, testimonies to the severity and perseverance of the conflict.

The reserve artillery of the Guard, which had nearly exhausted its ammunition, and had lost 50 horses, was obliged after four o'clock to be temporarily withdrawn, and retired to the crest of the nearest hill. The losses of the Guard were heavy, and had fallen chiefly on the first division. The Aide-de-Camp of the Divisional Commander* had fallen, and the total amounted to 38 Officers and more than 1,000 men, of which the first regiment had lost 13 Officers and 380 men, and Erckert's battalion of the second, 6 Officers and nearly 200 men. But support was near at hand. The head of the second division had already produced important results at Cistowes and Lipa, and still further relief was now fast approaching Chlum in the advanced guard of the first corps under Lieutenant-General von Grossmann, consisting of seven battalions of infantry,† a brigade of cavalry, and two batteries.

Passing Maslowed, which was even then not clear of the enemy, Lieutenant-General von Grossmann directed his march on Chlum and Lipa, where his arrival was most opportune. As the commander of the 1st rifle battalion was in the act of reporting to General von Hiller, the latter was struck in the breast by a splinter of shell, fell from his horse, and died as he was carried to the rear. Lieutenant-General von Grossmann at once assumed the command at Chlum, two attempts of Austrian infantry were successfully repulsed, and the 4-pounder batteries which accompanied his advance guard were enabled to take up a position between Chlum and Lipa, from which they fired with murderous effect on the Austrian masses, which were at length compelled to take refuge in Rosberitz.

Soon after 4 o'clock, General von Grossman gave orders to the combined detachments at Chlum to descend the hill and recapture the village. As they were in the act of so doing, a long line of cavalry was observed advancing from the direction of Sadowa, which proved to be that of the first Army, at its head Major-General Count Gröben and the 12th Thuringian Hussars.

It was now plain that the Austrian centre had been driven in; and the recapture of Rosberitz may rather be attributed to the general withdrawal of the Army than to the success of any direct assault of the Prussians. In fact the day was lost, and had been so virtually since half-past 2 o'clock, both wings were in full, but by no means hurried, retreat, and all that now remained to Field-Marshal Benedek was to draw off with the least possible loss, and to keep the advancing enemy at bay till darkness covered his movements.

Notwithstanding repeated attacks of the Haller Hussars, Zastrow had succeeded in assembling the eleventh division at Nedelist. Relieved by the withdrawal of the second corps across the bridges at Lochenitz

* Lieutenant The-Losen.

† 1st Regiment, 41st Regiment, 1st Rifle Battalion.

and Predmeritz,* and of the second light cavalry division, which followed the movements of this corps, General von Mutius was enabled to direct the whole force under his command to the assistance of the centre. It was at this period of the day that the 4th Prussian hussars, while covering the left of Zastrow's division during the advance from Sendrasitz on Nedelist, had an unfortunate encounter with the Austrian cavalry. The regiment, which formed part of a combined brigade under Lieutenant-Colonel von Wichmann of the 8th dragoons, had already broken into the gallop when it fell suddenly into a hollow way, previously concealed from view by the high corn. Attacked in turn by the Palffy Hussars, and exposed also to the fire of a battery near Lochenitz, the regiment was only extricated from its difficulties after the loss of nearly 50 men, and as many horses.

The eleventh division, making a change of front half right, received orders to march on Rosberitz, Wsestar, and Sweti, as soon as the progress of the twelfth afforded full cover to its left. This movement was successfully executed. The twenty-second brigade marched on Rosberitz, the twenty-first on Wsestar and Sweti, where it again encountered a brigade of the fourth corps under the Archduke Joseph. The village† was carried after a stout resistance at about half-past four o'clock or a little later, and the Austrian brigade continued its retreat as a cover to the reserve artillery.

The Elbe Army had also continued to press back the retreating left wing of the enemy, but had not succeeded in cutting his line of retreat towards the high road. Few trophies were gathered on this part of the field, beyond the prisoners which had been made in the earlier attacks on the position at Problus, and the villages of Prim.

It was during the progress of these operations that the general advance of the first Army, as directed by the King at half-past 3 o'clock, became evident.

The assistance of the cavalry was almost simultaneously demanded by the commanders of the second and third corps. Two brigades were at once pushed to the front, commanded respectively by Major-Generals Count Gröben,‡ and Duke William of Mecklenburg, both composed of light cavalry, with the exception of one regiment of Lancers (the 11th) which formed part of Duke William's brigade. With the former, which crossed the river at Sadowa, Prince Frederick Charles himself advanced; with the latter§ Prince Albrecht, youngest brother of the King, who commanded the great cavalry reserve; while the King, impelled by an eager impetuosity, of which few men are capable in the seventieth year of their age, placed himself at the head of his advancing troops, and rode keenly forward towards the thickest of the battle. The long-hoped-for, long-expected moment had

* The 2nd Corps, as I learn from a narrative, published in January, 1867, by its Commander, Count Thun Hohenstein, lost during the day 6,138 Officers and men, its strength having been 29,524 of all ranks.

† Sweti.

‡ Count Gröben is the brother of an officer who made the campaign of 1845 on the Sutlej with our army, in attendance on Prince Waldemar of Prussia, and who died of fever caught in Schleswig in 1864.

§ This brigade crossed at Sowetitz.

at length arrived, which was to put an end to the anxieties of hours, and to bring the reward of patience and endurance.

The difficulties attending the passage of the Bistritz must not be underrated. The advancing cavalry was mixed up with masses of infantry, and trains of artillery, in such a manner that its formation was completely broken up, and the regiments came singly into the fight.

Gröben's brigade, which followed the line of the high road, took advantage of open ground to the south-east of the wood of Sadowa, and advanced in two columns past Langenhof in the direction of Rosberitz, the Thüringen Hussars on the left, the Neumark Dragoons on the right.

Near this village, the General who had hastened on in front of his brigade, caught sight of a retiring mass of the enemy, while at the same time he perceived the Prussian columns descending the hill of Chlum in the direction of the village. In support of this movement, he ordered the Hussars to incline to the left and attack to the front, the Dragoons to follow in reserve. The Hussars deployed, and attacked with success, riding over the infantry and capturing four guns, though not without loss from the infantry fire, Count Gröben himself being severely wounded in the *melée*.

The Neumark Dragoons were not so fortunate. In the confusion inseparable from passing the infantry and artillery now pressing forward from the valley of the Bistritz, the main body of the Dragoons, three squadrons under their Lieutenant-Colonel, had become separated from the two squadrons which followed the Hussars in support, and had taken the originally designated direction of Stresetitz. It was while they were thus detached that a dense mass of the enemy's cavalry was suddenly observed approaching from Rosnitz, which proved to be the heavy cavalry division of Prince Schleswig Holstein, consisting of the Brigades Schindlocker and Prince Solms, accompanied by a small detachment of Hussars. To cover the re-assembly of the now scattered Thüringians, the fourth and fifth squadrons of the Dragoons, assisted by such of the Hussars as had been hastily rallied, threw themselves on the head of the hostile column, and as a natural consequence were punished for their temerity, by being driven with loss in the direction of Langenhof. Part of the Austrian cavalry was driven back by the fire of infantry from a farm-house on the high road, but the remainder followed in hot pursuit till checked by an attack of the fourth (Pomeranian) Lancers, which caused them to break off to their left, and brought them under the fire of detachments of the Guard, and of the second and third corps which occupied the village, and a sheepfold immediately south-east of it. One regiment of heavy cavalry, believed to have been the Ferdinand Cuirassiers* of Prince Solms' brigade, had followed Schindlocker's left flank in a somewhat retired eschelon, and in perfect order. Passing a little to the southward of the village, from whence they received fire from the infantry, they met the leading divisions of the Zieten Hussars, and a sharp

* It is incorrect to call the Austrian heavy cavalry Cuirassiers, as they wear no cuirass; they are heavy dragoons, and so, I believe, they are now called.

encounter took place. Still further to the south the remainder of the Hussars, under the personal direction of Duke William, and three half squadrons of the 4th Lancers became involved with another body of Austrian Cuirassiers, supposed to have been the remainder of Prince Solms' brigade.

Till we receive more reliable accounts from Austrian sources, it is hard to say who had the best of it. Certain it is, however, that whatever was their reception, the Prussian light cavalry did not avoid the encounter with the Austrian Cuirassiers, and that the Austrian cavalry fought under the disadvantage of being driven by the varying phases of the combat under the fire of the enemy's infantry, before which, and the attacks of the cavalry, they eventually withdrew, part towards the wood of Bor, part towards the village of Rosnitz. The two squadrons of the 3rd Dragoons lost 4 Officers, 3 cadets, and 96 men; the 12th Hussars 4 Officers and 45 men; the 4th Lancers 6 Officers and 30 men; and the 3rd Hussars 15 men in this succession of encounters, in which the Prince Albrecht of Prussia, and the divisional Commander, Major-General von Hann, personally assisted.

The remaining squadrons of the 3rd Dragoons had, as I have before mentioned, continued to advance in the original direction to the right of Langenhof. Lieutenant-Colonel von Willisen, after passing through a trying fire from the Austrian batteries, reached Stresetitz, near which village he waited for the opportunity to attack with advantage. But few minutes had elapsed, when he became aware of the approach, from Rosnitz, of a greatly superior force of Austrian cavalry, and withdrew towards Stresetitz, which was occupied by detachments of the third Army Corps. Encouraged however by the approach of a regiment of Lancers, and relying on their support with a confidence which was fully justified, he wheeled up the divisions, formed line, and bore down obliquely on the advancing Cuirassiers at a trot. A furious *meleé* ensued. The three squadrons found themselves engaged with two complete regiments of Cuirassiers, which enveloped them in flank and rear, and would probably have suffered still more severely, had not the Austrian support been checked by the fire from the Prussian infantry and artillery at Stresetitz. As it was, the Dragoons lost 8 Officers and 92 men, their total losses during the battle amounting to 12 Officers, 189 men, and 87 horses. The Cuirassiers were in the first flush of their success, when Prince Hohenlohe,* at the head of the 11th Lancers, swept down on their broken line at a sharp gallop, shattered its formation, and effected the complete discomfiture of the brigade. The Austrian losses were very severe, Prince Windischgrätz, who commanded the brigade last mentioned, fell severely wounded into the hands of the Prussians, and four Colonels were wounded in the succession of combats which I have narrated, while the scene of the encounter was strewn with the relics of these fine regiments. Bravest among the brave was a countryman of our own, Major Beales, whom I afterwards heard of as lying wounded at the château of Hradek, and whose good conduct on the field won him promotion to higher

* Brother of the Commander of the Field Artillery of the Guard.

rank, and the decoration of the Iron Crown. Still further to the right* the remaining brigade of Count Coudenhove's division also came into collision with the 1st Dragoons of the Prussian Guard, and the 5th Hussars, the former part of the brigade Rheinbaben, of the cavalry reserve, the latter part of the divisional cavalry of the second Army corps. The attacking lines rode through and through each other with varying success, and a body of Austrian Lancers made so near an approach to the position occupied by the King of Prussia within 300 yards of Stresetitz whence His Majesty had witnessed these exciting conflicts, that one of his staff hastily formed the head-quarter guard to ward off the impending danger. It was all, however, of no avail. The Prussian Armies were now in full onward movement, Rosberitz and Wsestar were already in their hands, the artillery had extricated itself from the valley, and was sweeping the plain in every direction; the circle was growing narrower with each passing minute, and all that remained to these noble troops, was to follow the disorganised mass, whose retreat they had secured by their bravery and self-devotion.

The Austrian artillery, which had throughout the battle been handled in a manner which impressed me more deeply than any circumstance of that eventful day; which threw away no chance; which fought its guns with an ability deserving of the highest praise, and with a bravery which should never be forgotten, had taken up a position near Rosnitz, from which however, the steady advance of the Prussian guns in a gradually narrowing circle, eventually compelled it to retire. Rosberitz was recaptured at about half-past 4 o'clock by detachments from the guard and from the first and sixth corps, while the remainder of Zastrow's division had occupied Wsestar, and was pushing on towards Rosnitz and Briza.

At 5 o'clock the Crown Prince met Prince Frederick Charles on the heights of Chlum; here the two leaders of the Prussian armies embraced each other, with kindly words of thanks and welcome, amid the exciting cheers of the surrounding soldiery, the spattering fire of musketry from the villages on the high road, and the sullen roar of the lines of hostile artillery.

With the capture of Briza, and the establishment of the Elbe Army at Bor, the front of the battle had contracted to little more than two English miles. To the right Lieutenant-General von Etzel, with a weak detachment of the sixteenth division, was moving on Charbusitz, where he was brought to a stand-still by the superiority of the Austrian fire from high ground to the west of Stösser. The Prussian guns were compelled to withdraw for a time before the fire directed on them, were re-inforced and again advanced, until towards half-past 6 o'clock, the second and Elbe armies joined their flanks in front of the first Army, occupied Sterizek and Charbusitz, Klacow, and Briza, while advanced detachments stood in the vicinity of Stösser and Ziegelschlag. Further attempts at pursuit of the Prussian cavalry were defeated by the determined attitude of the Austrian artillery, which still covered

* Prussian right.

the withdrawal of their broken Army, and soon after that hour, orders were issued to the Prussian troops to remain on the ground which they occupied, by the following memorandum :—

"To-morrow will be a day of general rest, and only such movements "will be undertaken as are necessary for the convenience and re-"assembly of the troops. The outposts, towards Josephstadt, are to be "furnished by the second, those towards Königgrätz by the first Army, "and the forces under the General of infantry, von Herwarth, will, as "far as possible, carry out the pursuit of the enemy in the direction of "Pardubitz. The division of Landwehr of the guard is to move on "Chlumetz.

(Signed) "VON MOLTKE.

"Near Königgrätz, the 3rd July, 1866,
6½ o'clock P.M."

His Majesty the King, undeterred by the fire of the enemy's artillery, took post, towards the end of the battle, to the east of the wood of Charbusitz, whence he watched the last movements of the retreating Austrians.

From Chlum the Crown Prince had issued orders to General von Steinmetz to take up the pursuit with the fifth corps. These orders reached the General at about six o'clock, when close to Rosberitz. Similar orders to the reserve cavalry of the second Army, though despatched in duplicate, failed to reach the divisional Commander, and though Major-General von Hartmann with one brigade joined the advancing fifth corps, the two other brigades of his division were left at Rosberitz. Towards 8 o'clock the fifth corps and the cavalry brigade reached Klacow, where a stop was put to their further movements, after a march of twelve hours, by the direct order issued from the Prussian head-quarters.

At about the same hour the Crown Prince, attended by a small remnant of his staff, which had been gradually diminished by the despatch of orders, and by the weariness of horses which were no longer capable of moving out of a walk, encountered the head-quarter staff in a meadow between Problus and Langenhof. A more impressive scene has seldom been witnessed. The King, warned of the approach of his son, turned his horse, and riding through his staff, met him in the open space between the two parties of horsemen. Such moments are rare in any life, and the spectators of the interview may well be excused for the tears of emotion that filled all eyes. The Crown Prince had repeatedly kissed his Majesty's hand, when the King, opening his arms, father and son were wrapt in a mutual embrace. As they turned away in a proud attempt to master their emotion, the King, holding out the Cross of Merit, thrust it into the Prince's hand with these words, "Take it, for you have deserved it,"—it was a complete surprise, the telegraphic communication that the cross had been conferred for the victories of the preceding week, having fallen into the hands of the Austrians. Another warm embrace, and a few words of broken thanks, brought the affecting interview to a close. The Crown Prince presented to the King, Generals von Blumenthal and

von Stosch his Chief of the Staff and Quartermaster-General, and the two staffs mingled in mutual congratulation. The very ground on which the meeting took place was strewn with the dead and wounded, a declining sun shed its rays full on the group, while far away, towards Königgratz and the great southern high road, was heard the distant roar of that noble artillery which, whatever its misfortunes and losses may have been, won on that day the admiration and respect of all who were exposed to its fire.

The Elbe Army bivouacked at Sterizek, Ober, Nieder Prim, and Problus, where the head-quarters were established. The first Army at Bor, Problus, Wsestar, Langenhof, Stresetitz, Chlum, and Lipa; while one division remained at the Roskos Berg, the reserve artillery withdrew to Klenitz, and the two divisions of the reserve cavalry bivouacked respectively at Rosnitz and Nechanitz. The second Army occupied, with the first and fifth corps, ground on each side of Rosnitz; the sixth corps remained at Briza and Sweti; the Guard between Wsestar and Langenhof; and Hartmann's cavalry division, between Rosberitz and Briza. The King and Prince Frederick Charles returned to Horitz, where they passed the night, the Crown Prince to Horinowes, at which places the respective head-quarters remained on the following day.

The Prussians lost 359 Officers, and 8,794 men, killed, wounded, and missing; the losses of the Austrians amounted to 44,200 of all ranks,* of whom 19,800 fell as prisoners into the hands of the victors. The trophies were 5 colours, 160 Austrian, and 1 Saxon gun, and a mass of war material, which almost exceeds belief. The muskets must be reckoned by thousands, the ammunition and baggage-waggons by hundreds, while two pontoon trains and a field-telegraph were found abandoned in the deep ground near the fortress of Königgrätz.

APPENDIX.

Ordre de Bataille of the Prussian Armies, on the 3rd of July, 1866.

Commander-in-Chief, His Majesty the King.

1st Army.—Commanding-in-Chief, H.R.H. the Prince Frederick Charles of Prussia.

2nd Army Corps.—Lieutenant-General von Schmidt.

3rd Division (Infantry).—Lieutenant-General von Werder.

5th Brigade (Infantry).—Major-General von Jannschowsky, 42nd regiment, 2nd regiment.

6th Brigade.—Major-General von Winterfeld, 54th regiment, 14th regiment.

4th Division.—Lieutenant-General Herwarth von Bittenfeld.

* 4,861 killed, 13,920 wounded, 25,419 missing.

7th Brigade.—Major-General von Schlabrendorff, 9th regiment, 49th regiment.

8th Brigade.—Major-General von Hanneken, 61st regiment, 21st regiment.

3rd Heavy Cavalry Brigade.—Major-General Baron von der Goltz, 9th Lancers, 2nd Cuirassiers.

Attached to Divisions.—5th Hussars, 4th Lancers, 2nd Rifles, and 2nd Engineers.

13 batteries of the 2nd regiment of Field Artillery.

5th Division.—Major-General von Kamiensky.

9th Brigade.—Major-General von Schimmelmann, 48th regiment, 8th regiment.

10th Brigade.—Colonel von Debschitz, 18th regiment, 12th regiment.

6th Division.—Lieutenant-General von Manstein in command of both divisions.

11th Brigade.—Major-General von Gersdorff, 35th regiment, 60th regiment.

12th Brigade.—Major-General von Kotze, 64th regiment, 24th regiment.

Attached to Divisions.—3rd Rifles, two companies; 3rd Engineers.

8 batteries of the 3rd regiment of Field Artillery.

7th Division.—Lieutenant-General von Fransecky.

13th Brigade.—Major-General von Schwarzhoff, 66th regiment, 26th regiment.

14th Brigade.—Major-General von Gordon, 27th regiment, 67th regiment.

8th Division.—Lieutenant-General von Horn.

15th Brigade.—Major-General von Bose, 31st regiment, 71st regiment.

16th Brigade.—Major-General von Schmidt, 72nd regiment.

Attached to Divisions.—10th Hussars, 6th Lancers, 4th Rifles, three companies 4th Engineers.

8 batteries of the 4th regiment of Field Artillery.

Attached to 1st Army.—Cavalry Corps, H.R.H. Prince Albrecht of Prussia.

1st Cavalry Division.—Major-General von Alvensleben.

1st Light Cavalry Brigade, Major-General von Rheinbaben.

1st Dragoons of the Guard, 1st Lancers of the Guard, 2nd Lancers of the Guard, 1 battery of Horse Artillery.

2nd Heavy Cavalry Brigade, Major-General von Pfuel.

6th Cuirassiers, 7th Cuirassiers, 1 battery of Horse Artillery.

2nd Cavalry Division.—Major-General Hann von Weyhern.

2nd Light Cavalry Brigade.—Major-General Duke William of Mecklenburg Schwerin.

3rd Hussars, 11th Lancers, 2nd Dragoons of the Guard, 1 battery of Horse Artillery.

3rd Light Cavalry Brigade.—Major-General Count von der Gröben.

3rd Dragoons, 12th Hussars, 1 battery of Horse Artillery.

Combined Cavalry Brigade.—Major-General Count von Bismarck-Bohlen, 2nd Dragoons, 3rd Lancers.

Reserve Artillery of the First Army.—Major-General Schwarz, 8 batteries of the 3rd, and 8 of the 4th Army Corps.

Elbe Army.—General Herwarth von Bittenfeld.

Advanced Guard.—Major-General von Schoeler commanding 31st brigade, 1 battalion each of 17th, 28th, 33rd, 40th, 56th, and 69th regiments, the 8th Rifles, two batteries of Field Artillery, and a company of Engineers.

Cavalry Brigade.—Major-General Count von der Goltz, 11th Hussars, 7th Hussars, 1 battery of Horse Artillery.

14th Division.—Lieutenant-General Count Münster Meinhövel.

27th Brigade.—Major-General von Schwarzkoppen, 16th regiment, 2 battalions 56th regiment, 7th Rifles.

28th Brigade.—Major-General von Hiller, 2 battalions 57th, 2 battalions 17th regiment.

15th Division.—Lieutenant-General von Canstein.

29th Brigade.—Major-General von Stückradt, 2 battalions 40th, 2 battalions 65th regiment.

30th Brigade.—Major-General von Glasenapp, 68th regiment, 2 battalions, 28th regiment.

Reserve Cavalry Brigade.—Major-General von Kotze, 8th Cuirassiers, Pommeranian Landwehr Cavalry.

Combined Reserve Artillery.—6 batteries of the 7th, and 6 of the 8th Army Corps.

Attached to Divisions.—5th Lancers, 7th Dragoons, six batteries of the 7th and 8th Field Artillery regiments, two companies of Engineers.

As covering force to the Reserve Artillery.—1 battalion, 57th regiment.

16th Division.—Lieutenant-General von Etzel.

Fusilier Brigade.—Colonel von Wegerer, 2 battalions 33rd regiment, 34th regiment.

31st Infantry Brigade.—Colonel Schuler von Senden (temporary), 29th regiment, 2 battalions 69th regiment.

Attached to Division.—7th Lancers, 3 batteries of the 8th field artillery regiment, 1 company of the 8th Engineers.

Infantry Division of Landwehr of the Guard.—Major-General von Rosenberg, 4 regiments (11½ battalions), 1 cavalry regiment, 2 reserve batteries.

Second Army.—Commanding-in-Chief, H.R.H. the Crown Prince of Prussia.

Corps of the Guard.—H.R.H. General Prince Augustus of Würtemberg.

1st Guard Division.—Lieutenant-General Hiller von Gaertringen.

Advanced Guard.—Major-General von Alvensleben.

2nd Guard Brigade.—Colonel von Pape, 2 companies rifles of the Guard, 2 battalions 2nd Foot Guards, 2 battalions Fusilier Guards, 2 squadrons Hussars of the Guard, 2 batteries of Field Artillery.

1st Guard Brigade.—Colonel Knappe von Knappstädt, 2 battalions 3rd Foot Guards, 2 battalions 1st Foot Guards.

Fusilier Brigade.—Colonel von Kessel, 1 battalion 2nd Foot Guards, 1 battalion 1st Foot Guards, 1 battalion Fusilier Guards, 2 squadrons Hussars of the Guard, 2 companies Rifles of the Guard, 2 batteries of Field Artillery.

2nd Division of the Guard.—Lieutenant-General von Plonski.

Advanced Guard.—Colonel von Pritzelwitz, battalion of Sharpshooters of the Guard, Fusilier Battalion of the Regiment Emperor Francis, Fusilier Battalion of the Regiment Emperor Alexander, 3rd Regiment Lancers of the Guard, 1 battery of field artillery, 1 company of Engineers of the Guard.

3rd Brigade of the Guard.—Major-General von Budritzki, 2 battalions Emperor Alexander, the regiment of the Queen Elizabeth, 1 battery of Field Artillery.

4th Brigade of the Guard.—Major-General von Loën, the regiment of the Queen, 2 battalions Emperor Francis, 2 batteries of Field Artillery.

Reserve Cavalry.—1st Heavy Cavalry Brigade, H.R.H. Prince Albrecht (son) of Prussia, regiment of Garde du Corps, regiment of Cuirassiers of the Guard, 1 battery of Horse Artillery.

Reserve Artillery.—Colonel Kraft Prince of Hohenlohe Ingelfingen, 5 batteries of Field Artillery of the Guard.

First Army Corps.—General von Bonin.

1st Division.—Lieutenant-General von Grossmann.

1st Brigade.—Major-General von Pape, 41st regiment, 1st regiment, 1st Rifles.

2nd Brigade.—Major-General von Barnekow, 3rd regiment, 43rd regiment.

2nd Division.—Lieutenant-General von Clausewitz.

3rd Brigade.—Major-General von Malotki, 2 battalions 44th regiment, 4th regiment.

4th Brigade.—Major-General von Buddenbrock, 45th regiment, 2 battalions 5th regiment.

Reserve Cavalry.—Colonel von Bredow, 12th Lancers, 3rd Cuirassiers, 1 battery of Horse Artillery.

Reserve Artillery.—Colonel von Oertzen, 7 batteries of Field Artillery.

Attached to the Divisions.—Eight batteries of Field Artillery, 1st battalion of Engineers, 2nd Hussars, 1st Dragoons, 8th Lancers.

Fifth Army Corps.—General von Steinmetz.

9th Division.—Major-General von Löwenfeld.

17th Brigade.—Colonel von Below, 37th regiment, 58th regiment.

18th Brigade.—Major-General von Horn, 1 battalion 5th rifles, 7th regiment.

Combined Cavalry Brigade.—Major-General von Wnuck, 1st Lancers, 4th Dragoons.

10th Division.—Lieutenant-General von Kirchbach.

19th Brigade.—Major-General von Tiedemann, 6th regiment, 46th regiment.

20th Brigade.—Major-General Wittick, 47th regiment, 52nd regiment.

Attached to Divisions.—8 batteries of Field Artillery, Regiment No. 5, two batteries of Horse Artillery.

Reserve Artillery.—Colonel von Kameke, 5 batteries of Field and Horse Artillery.

6th Army Corps.—General von Mutius.

11th Division.—Lieutenant-General von Zastrow.

21st Brigade.—Major-General von Hanenfeldt, 10th regiment, 50th regiment.

22nd Brigade.—Major-General von Hoffmann, 38th regiment, 51st regiment.

Combined Cavalry Brigade.—Lieutenant-Colonel von Wichmann, 4th Hussars, 8th Dragoons.

12th Division.—Lieutenant-General von Prondzynski, 1 battalion 22nd regiment, 23rd regiment, 6th rifles, 6th Hussars, two companies of the 6th Engineers.

Reserve Artillery.—Colonel von Scherbening, 4 batteries Field and Horse Artillery of Regiment No. 6.

Attached to Divisions.—6 batteries of Field Artillery Regiment No. 6.

Cavalry Division of the Second Army.—Major-General von Hartmann.

First Brigade.—Major-General von Witzleben, 2nd Hussars, 10th Lancers.

Cuirassier Brigade.—Major-General von Borstell, 1st Cuirassiers, 5th Cuirassiers.

Landwehr Brigade.—Colonel von Frankenberg, 1st Landwehr Lancers, 2nd Landwehr Hussars, two batteries of Horse Artillery.

RECAPITULATION.

	Battalions.	Rifles.	Squadrons.	Batteries.	Engineer Companies.
1st and Elbe Army..	100¾	5	103	74	10
Second Army	80½	5	81	56	9
Total	181¼	10	184	130	19
Landwehr Division of the Guard.	11½	..	3	2	..

Evening Meeting.

Monday, June 29th, 1868.

VICE-ADMIRAL SIR HENRY J. CODRINGTON, K.C.B., in the Chair.

NAMES of MEMBERS who joined the Institution between the 15th and 29th June, 1868.

LIFE.

Donavan, E. W., Colonel, h.-p., late 100th Regt. 9*l.*
Radcliffe, W. P., C.B., Colonel h.-p., late 20th Regt. 9*l.*

ANNUAL.

Innes, Alex., Maj. Aberdeen Art. Vols. 1*l.*
Baring, J. D'Oyly, Lt.-Col. 107th Rgt. 1*l.*
Burlton, C. E., Lieut. R.N. 1*l.*
Jones, Jenkin, Lieut.-Col. R.E. 1*l.*
Mallet, Harold E., Capt. 18th Huss. 1*l.*
May, John, Lieut. Hants Mil. 1*l.*
Tombs, Sir Henry, K.C.B., C.C., Major-Gen. Royal Artillery. 1*l.*
Burnell, D. O., Major 16th Lancers. 1*l.*
Poole, W. Stewart, Lieut. Royal Art.
Massy, H. H., M.D., Dep. Inspector of Hospitals.

NAVAL TACTICS, WITH SOME REMARKS ON THE RECENT EXPERIMENTAL CRUISING OF THE MEDITERRANEAN AND CHANNEL SQUADRONS.

By Captain E. A. INGLEFIELD, R.N., F.R.S.

IT was at the request of one of the members of the Council of this Institution, that I was originally induced to prepare a paper upon Naval Tactics, and now on the invitation of that body, have come here to read it to the meeting this evening. Let me add that I did not arrive at this conclusion without some hesitation, partly from a sense of my own inability to do justice to the subject, and partly because I felt that the only grounds upon which I could presume to place myself before you to discuss the doctrines (if I may use such a term) of "naval tactics," must be based upon the experiences I had gained as a leader of the lee line during several cruizes with the Mediterranean and Channel squadrons, and I thought that these experiences were not to be dealt with as my own property, but rather as matter at the disposal of my Lords

Commissioners of the Admiralty. A reference, however, to their Lordships set my mind at rest upon this latter point, as they were pleased to consider that some remarks upon the manœuvres carried out under the old *régime* by the Mediterranean squadron, and under the present system by the Channel squadron, might prove beneficial to the service, inasmuch as that these experiences could, through the medium of a paper read in this Institution, be imparted to such of my brother Officers on half-pay as were desirous of profiting by them, and thus afford the means of comparing the merits of the two systems.

I am aware that an able paper on "fleet manœuvring" was read here by Commander Pellew so lately as May of last year, and since then, that he has published, under the same title, a work which deserves to be commended. Now I do not propose to discuss the various points he raises in that publication, nor do I wish that the few remarks I have to make upon Naval Tactics should be considered as a proposition for setting aside his or any other scheme. I shall rather confine myself as nearly as possible to a statement of a few of the principles, upon which it appears to me, should be founded the fundamental rules for the governance of a fleet at sea, and in a general way remark upon the experimental cruizing of the squadrons to which I have made allusion.

The science of "Naval Tactics"—and I do not speak unadvisedly when I use the word "science"—is one which, perhaps now, more than ever, demands the serious study of all naval Officers, but more especially those who, from their position in the service, have a fair expectation of command, either in single ships, or with a squadron, independently or in supreme command. Formerly our great sea fights were won as much through the skill and good *seamanship* of the Naval Commanders as by the energy and daring of those who followed their fortunes, and fought under their auspices.

When two hostile fleets met on the open sea, the "weather gauge" was—in those days—the great consideration, and the significance which a prize fighter puts upon the chances which give him the title to have the sun at his back, might not be inaptly compared to that which, by the chapter of accidents, gave the weather guage to the one of these fleets when first sighting each other. The skilful boxer who has lost the right of selecting his side of the ring, seizes every opportunity of bettering his position during the fight; and so when in former days it chanced that the Commander of a British fleet found himself to leeward of his enemy, by skill in manœuvring he was often enabled to gain the weather guage, which afforded the choice of battle, and to use the words of a great sea captain, "thus to earn for himself the first half of the fight." Now alas! our superior seamanship, and the sailing qualities of our vessels are of small avail. No longer would it be an important question (except in stormy weather, off a lee shore) as to which bearing with regard to the wind, the enemy might happen to appear.

Powerful engines, ever ready to urge the mighty battle ships hither and thither, utterly regardless of winds and tides, are to be found as perfect in form and action, and as well protected from the devastating

shell on board the war ships of nearly every European power, as in our own. Nay, do not even the puny States on the South American continent issue their orders, regardless of cost, to our private ship-yards, and not unfrequently do our public journals draw an invidious comparison between the magnificent iron-clad, with all the latest improvements, which has been launched from one of these yards for some foreign potentate, with the inferior vessel built for our own Government, at perhaps the same cost, but still an unequal match for the foreign giant, and thus is set at nought one of those qualities, *superior seamanship*, which in the British sailor has gone so far to make him the best of his class in all the world. It is thus because our ships are no longer so superior to those of all other nations—as was their wont to be in former times—that England loses much of her naval prestige amongst the nations of the earth.

With these thoughts, which have been confirmed by the opportunity that has been afforded me during my late service in the Mediterranean, of observing the armour-clad ships of other nations, I would urge upon my brother Officers who are younger, and have had less experience, the necessity for making the study of *naval tactics* one of the most important branches of their education; to do so successfully they must not *shy* at the term I have used, for it must be treated as a *study*.

There are several points which should be regarded as the leading principles upon which a fleet must *always* be managed, and under the comprehensive title of "naval tactics," must be understood the management of a fleet under sail, as well as steam, the former truly being now almost obsolete, except as an exercise, for no Commander-in-Chief now-a-days would think of manœuvring a fleet in the presence of an enemy under any other conditions but with a full head of steam; nevertheless if the principles of steam manœuvring are made the first consideration, the management of a squadron under sail will not be found a difficult task.

Before I allude more particularly to the formation for battle of a fleet, I must say a few words upon the subject of the position of the Commander-in-Chief of the squadron.

In practice, I have remarked the great difficulty which happens at certain times, and during certain evolutions, of the Commander-in-Chief *properly observing*, and therefore *certainly directing* all the vessels of his squadron. For example, should the Admiral desire to place himself in the van of his line, and that should happen to be a long one, he cannot possibly remark whether the ships are kept at proper distances; and only with difficulty, if any casualty should occur, or any signal be made, owing to the smoke, not only from his own funnel, but from those of the ships of his squadron, which combined tends so to obscure the vision (especially when the wind is right ahead or right aft), that it becomes almost impossible for him to descry the exact position of any of the ships, but those in his immediate proximity. Another, and perhaps more important point is the difficulty experienced by the ships of the squadron in making out the Admiral's signals, for it can only be by a repetition from the ships nearest to him that the

rearmost ship can become acquainted with his orders. This difficulty will be much increased in action when the smoke from the guns will render obscurity still more obscure, and it will apply equally to the Admiral's position when the column is reversed, an evolution which is often performed both under the old and new form of steam tactics, and whereby the Admiral's would become the rearmost ship of the fleet. I know I shall be met by the rejoinder that this is not a common occurrence, and that the Admiral *might* place himself in the centre of the line; but British Admirals are wont to lead the Van, and in case of a retreat to take the Sternmost position. I believe I am not singular in offering an opinion, that if the Commander-in-Chief could form and manœuvre his fleet from a vessel *not in line of battle*, he would do so with much greater convenience to himself and benefit to the service upon which he may be employed. However, whether this should ever become the prescribed position for the Admiral or not, it is unnecessary now to consider, and it does not in either case interfere with the general formation for fleet manœuvres, for the ship spoken of as *the* flag ship during all evolutions would be the vessel of either the Commander-in-Chief, or the Second in Command leading in line of battle.

Here I must touch upon a point which experience again has forced upon my notice. It is customary to place all the ships of a fleet in order of battle according to the seniority of their respective captains. At first sight it would seem a delicate task for a Commander-in-Chief to interfere with the prerogative of his Second to lead the lee line, or to direct the third senior Officer to place himself as a rearmost ship, but the necessities of the service (which will doubtless be the first consideration of a good Officer) require that the ships of the fleet on active service should be placed with due regard to their qualities for speed, weight of armament, and that *spécialité*, which, being of such recent introduction, requires more immediate attention, viz., the ramming properties of some of our modern vessels of war. Doubtless the Commander-in-chief's vessel would be the most powerful, both as regarded speed and armament. She might or might not be fitted as a ram.

Unless there was something which rendered the vessel of the Second in Command very unfit for a leader of the lee line, it would certainly be most advantageous that she should assume the post to which the rank of that Officer entitled him; but for the rest of the fleet it appears to me that each ship should be placed according to her qualities for speed *first*, for armament in the *second* place, and *thirdly* in consideration of her properties as a ram: and here it may be well to remark, that the rams of a fleet might be advantageously placed as the rearmost vessels of each line, when advancing in two or three columns. I believe it has been suggested to make up the rear squadron, or third division, entirely of rams, and perhaps, when it was practicable, it would be useful to make this rear squadron a squadron of reserve, to be employed like a column of reserve, in military warfare; then, perhaps, the rams might be brigaded together; but I think under ordinary conditions, these rams would be better placed as the rearmost ships in each division, for believing how difficult at all times it will be found to ram a ship which

is in full possession of all her motive power, I conceive that a ram would find herself in better position for that special service if called into action when the first shock of battle had partially crippled, or at least paralysed the foe.

I have suggested that the ships should be placed in line of battle, more with reference to the qualities of the ships than with regard *to the seniority of the captains*. But there is another point which appears to deserve consideration, I mean the homogeneity, or rather the want of homogeneity in the speed of vessels of our present day squadrons.

It will easily be understood by Naval Officers that this want would be seriously felt by a Commander-in-Chief desirous of pursuing an enemy's fleet at his utmost speed.

Now, as an example, let us take the 8 hours full speed trial of the Channel Squadron off Lisbon last autumn; then the "Achilles" distanced the rest of the fleet, and had she been in pursuit of a flying enemy, would have brought them to action, unsupported by a single other vessel of the squadron.

This want of homogeniety (I can find no better term to signify my meaning) is fully appreciated by the French, who for the most part fit their ships with engines of sufficient power to ensure a minimum speed greater than the average speed of a corresponding number of our vessels of war.

To meet this want, some interesting experiments in towing were instituted by the Commander-in-Chief (Lord Clarence Paget) in the Mediterranean squadron, whilst I was serving under his orders, and I have here the tabulated form of these results. By them it will be seen that his object was to establish the fact as to the power at his disposal to bring all his squadron to a given point in the shortest space of time. This experiment was made by a comparison between the speeds obtained whilst the ships were under tow of each other, and it was based upon the consideration that thus all the ships would be brought into action together, by reducing the speed of the fastest, and increasing that of the slowest vessel in the squadron. To quote the words of Lord Clarence Paget, who says,—"Our towing trials may be shortly "stated to have resulted in a homogeneous speed of various ships, all "under steam, tied together, at something less than the mean of their "united individual speeds, and at an expenditure of coals of about the "same ratio. The only possible disadvantage was the risk attending "the operation, which I hold to be comparatively *nil*, since, if the lead-"ing ship suddenly broke down, her momentum would be sufficient to "sheer her clear of the others, cutting of course the hawsers. How-"ever, risk or no risk, it would, on certain occasions, when it was an "object to bring our *whole* force to a point in the smallest possible "time, be a great gain."

It will be remarked by a reference to the table, that the towing experiments, which lasted an hour each time, were made under certain disadvantages, the rear ship in each division, viz., the "Cruizer" in the weather line, showing a very low indicated horse-power, not more than one-half of that which the boilers were capable of developing, and the "Enterprise" in the lee line requiring a high power to tow her, for

though the engines worked satisfactorily, when the trial had ceased, she had not developed the full energy of her boilers.

Now, supposing the power to vary as the cube of the speed, and *vice versâ*, it will be seen that :—

Ships' Names.	Indicated Horse Power required to propel the same vessel separately at the speed given by log.	Power expended in towing.	Speed due to Horse Power as compared with 5th trial.	Time it would occupy to steam the ships 100 knots.
Victoria	2687·3	1003·5	11·67	h. m.
Gibraltar.....	2570·0	56·5	10·576	9 32
Cruiser	727·5	..	5·177 compared with trial trip	
Total	5984·8			
Prince Consort	2612·1	1526·0	12·22	
Royal Oak	3266·9	Nil	10·5	9 32
Enterprise	1130·0	..	8·091	
	7009·0			

The fifth trial alluded to, was one of full speeds, independently as a standard for comparison.

By the above it will be seen that the "Victoria" at full speed, not towing, would steam 100 knots in 50 minutes less time; "Gibraltar," 100 knots in 14 minutes less time; "Cruiser," 100 knots in 6 hours 28 minutes more time; expenditure of coal about the same. "Prince Consort," 100 knots in 1 hour 12 minutes less time; "Royal Oak," 100 knots in the same time as when in tow. "Enterprise," 100 knots in 2 hours 49 minutes more time; expenditure of coal about 10 tons less, by towing.

This table may prove interesting, because, as far as I know, these towing trials are novel as regards the intention for which they were instituted; and we may glean from their results the facts which have been summed up in the words, before quoted, of Lord Clarence Paget, than whom no Officer could have shown a more anxious desire, not only to instruct all those under his orders, but to learn by experiment himself, *in every possible way, and under every possible condition*, the fighting, steaming, and sailing qualities of the ships under his command.

The New Signal Code for the management of a steam fleet appears to me such a decided improvement upon the old one, that I am satisfied that nearly all the requirements of an Admiral in the management of

TACTIC BOARD.

Fig. 1.

Fig. 2.

Fig. 3.

J. Jobbins

squadrons have been met; and great credit is due to those who, with so much skill and patience, have digested the scheme, and so ably exemplified their labours. The Service is greatly indebted to Admiral Sir William Martin for the numerous observations he has published on Steam Tactics; these have been well supplemented by Admiral Sir Sydney Dacres, and are now compiled by Captains C lomb and Brent with simplicity and facility of reference, reflecting great credit upon these gentlemen. After these remarks, it is needless to add further comments on the value to my mind of the code of signals now employed in the New Signal-Book, excepting where I am desirous of remarking upon or comparing such isolated cases as are necessary to my purpose, and of these I am only permitted to speak in general terms, as the publication of signals or matter collected from the signal-books is prohibited by their Lordships. I leave the details therefore of the mechanical process by which the Admiral's orders are conveyed to his Captains, and desire to draw attention and invite discussion upon the manner in which these orders should be carried out.

Referring once more to the want of homogeneity in our fleets, I may remark that another difficulty presents itself in the management of a squadron where the speeds attainable are so varied. With reference to the speed of the engines, the natural method of meeting this disproportion in their speed value is by a process of tabulating the screw revolutions of each ship in the squadron as compared with their speed, and then assimilating them to each other, or otherwise by dividing the speeds into, say, three denominations, viz., full, half, and slow speed, and then fixing for each ship the number of revolutions necessary to maintain her progress at either of these speeds as established by the Admiral in rates of knots. Thus let it be supposed that the Admiral determines that full speed shall be 11 knots, half speed, 6 knots, and slow speed, 4 knots, and that whilst the flag-ship's number of revolutions to attain these three speeds were, say, 60 for 11 knots, 25 for 6 knots, and 10 for 4 knots, that of his next in command, 56 for 11 knots, 22 for 6 knots, 9 for 4 knots. Then, whenever the Commander-in-Chief made the signal "full speed," his second would cause the engines of his vessel to be put to 56 revolutions, and each ship of the squadron knowing the relative value of revolutions with regard to speed (in their individual vessels) would give the necessary instructions.

I found that orders were frequently imperfectly conveyed through the speaking tube to the engineer, the method of speaking through this tube being so different; and once on board the "Prince Consort," owing to the engineer of the watch misunderstanding the order of 28 revolutions for 38, we narrowly escaped a collision with the next ship, steaming, as was the custom of our Commander-in-Chief in the Mediterranean, continually in close order. To prevent the probability of a similar occurrence, I constructed a *revolution indicator*, of which I show here a rough figure (Plate xxii, fig. 1). It was placed over the engine-room hatch between the boom-boats, so that the face and back could be observed from the after and fore bridges. This indicator consisted of a circular box placed in a vertical position, and supported by suitable legs. The front and back of this box had apertures, through which

could be seen the figures marked upon the edge of a revolving disc inside, and which exactly corresponded with a similar instrument placed in the engine-room immediately facing the engineer on duty. These graduated discs were connected by an endless chain, which necessitated their working in unison, and thus there was constantly presented to the eye of the Officer on deck, and to him in the engine-room, a distinct signal, showing the number of revolutions at which the engines were working. The Officer in command could impart his instructions to the engine-room by means of a small handle, causing the wheel to revolve within its case, and a boy would be stationed to attend to this duty. By such an arrangement, no mistake could possibly occur unless the instrument were out of order, and its simplicity of construction (ours was made by the ship's joiner) rendered that contingency unlikely. Of course this instrument would tend to assist the regulation of the speed cones by day, and of the lanterns at night, hoisted at the yard-arms to indicate the number of revolutions at which the engines of individual ships were moving.

And here I must not pass over another feature in the management of the ships of the squadron, which deserves careful consideration. A great disproportion existing between the length of the ships which may be in line, as well as the angle at which the tillers can be put over, it follows, that if at a given speed the Admiral made the signal to alter course *simultaneously* 16 points, and each vessel were to put her helm hard over, on the signal being hauled down aboard the flag-ship, it would result in the whole squadron being thrown into confusion, and possibly cause some collisions, no two vessels turning within the same radius. Now, to prevent such an occurrence, it is desirable that upon a fleet being first formed, each ship should be required to supply to the Commander-in-Chief, a table, showing the radius at which she can complete the circle at full, half, and slow speed, and the angle at which she can put over her tiller.

Most ships, perchance from something in their build, and owing to the peculiar action of the water thrown from the screw on the rudder, turn in a smaller circle when the helm is put a-port, than when put a-starboard, thus the "Prince Consort," with the helm hard a-port, angle of rudder being 23 degrees, took 4 minutes and 56 seconds in turning a complete circle at full speed, while with the helm hard a-starboard, angle of the rudder 24 degrees, it required 5 minutes and 20 seconds to complete the full circle. It is clear, then, that to manœuvre a squadron with certainty and precision, it is desirable that vessels composing that squadron should be homogeneous in this respect. As a general rule, subject to variation of wind and sea, it is found that at a given speed, the less amount of helm given, the greater will be the diameter of the circle described, and the longer the time occupied, and also that with a given helm angle, the less the speed used, so much the less will be the diameter of the circle described, and so much longer the time of turning.

Lord Clarence Paget required that the vessels of his squadron should on convenient occasions perform a figure of 8 evolution. This was

done by placing buoys, as shown in the diagram (Plate xxii, fig. 2), and which may be briefly explained thus :—

A, B, C, D, are four buoys placed in the form of a parallelogram, of which the long side will be approximately 4½ times, and the short side, three times the length of the ship.

E, F are two buoys placed one length and a half of the ship apart, and at even distances from the centre of the parallelogram. The ship is to enter the parallelogram, either between B and D, or between A and C, the exact line of her stern passing the dotted line between the two buoys being noted, she is then to perform a figure of 8 within the parallelogram by crossing, each time between the points E and F, as shown in the diagram, and she will then come out at the opposite end of the parallelogram from that at which she entered, the precise moment of her stern passing between the buoys on leaving the parallelogram, being also noted.

No ship is to use more than half boiler power, but she may aid herself in any manner by the use of sails or otherwise, as may be deemed expedient.

When once the ship is within the parallelogram, if any part of her should touch the dotted straight lines between the buoys, she will be supposed to have grounded, or should she touch either of the buoys, E F, she will be supposed to have fouled the ships which they are intended to represent. In either of these cases the manœuvre must be presumed to have failed. The direction and force of the wind, the state of the sea, and the direction and strength of the current (if any) are to be noted during the experiment. This exercise had the effect of teaching the Officers what were the steering capabilities of their ships, not only whilst going a-head, but when moving astern; and I may add that after we had made the experiment twice, in which I am bound to say we did not quite succeed, I had much greater confidence in managing the vessel when moving in and out of confined harbours, or in close order with the squadron. Such practice as this must prove useful, and cannot fail to instil valuable instruction regarding the steering properties of a vessel, not only for the benefit of her commander, but also of the lieutenants and master.

If in case of war, the old fashion of carrying different coloured ensigns to distinguish the three divisions in a Fleet were again adopted, some advantage might be derived. This will be partially met by having vanes of different colours at the mastheads of the ships, and if I remember rightly, this has been proposed by the compilers of the new signal books.

I now come to the formation and arrangement of a Fleet. When ships meet with a view to their being "brigaded" together, the first duty of the Commander-in-Chief must necessarily be to divide and subdivide the Fleet as a body, into divisions and subdivisions, this arrangement and these terms being now-a-days considered more suitable than those formerly employed of *van*, *centre*, and *rear* squadrons. The Fleet may be divided according to its numbers into one, two, three, or four divisions, and these divisions may be again subdivided, and proper

distinguishing flags and pendants assigned to each. There will also be a number given to each ship, which is called her *Fleet number*.

Now this Fleet number will be found useful, not only whilst referring to the diagram, but when the Commander-in-Chief should desire to alter the position of any two ships in his squadron, then it will only be necessary to desire that these ships should change their Fleet numbers, and the Captain of each will immediately understand (by reference to a diagram), her division, sub-division, and the post she will have to fill in each manœuvre. To exemplify the formations of a Fleet, I have made the diagrams shown on this sheet (Plate xxiii).

Fig. 1, column in line a-head.
Fig. 2, columns of division.
Fig. 3, columns of subdivision.
Fig. 4, columns in line abreast (single column).
Fig. 5, columns of divisions sailing in lines of bearings.

These show what positions ships and columns should take up when *forming in orders*. *Close order* means two cables apart from mainmast to mainmast; *open order*, four cables apart. Columns twice as many cables apart as there are ships in the longest column, but never less than six cables. Each cable is supposed to be 100 fathoms. It is the rapid and certain change from one order to another, or into variations of these orders, which constitutes the skilful manœuvring of a squadron.

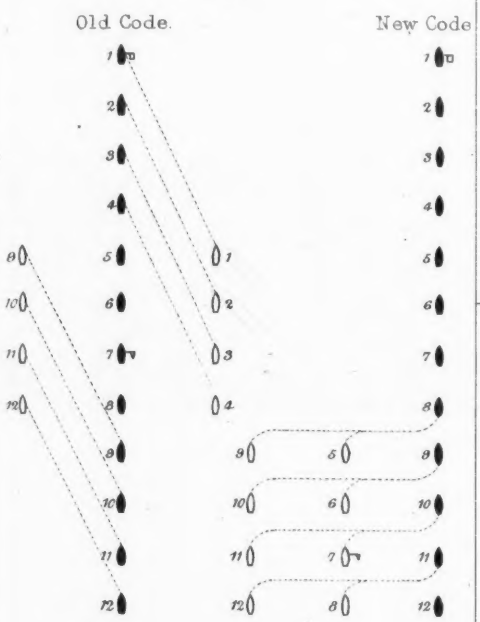
These evolutions may be classed under seven heads, viz., first, when the Fleet or squadron, after being becalmed, lying too, assembling, or otherwise situated,—is so as to be at the moment in no distinct formation. This class of evolutions comes under the head of "*forming orders;*" the second of "*changing formations;*" the third of "*changing direction of columns;*" the fourth of "*changing the course of the Fleet;*" the fifth of "*altering course*" only; the sixth of "*opening and closing, and stationing;*" and seventh, and lastly, a class of signals to comprehend "*miscellaneous evolutions.*"

Most of these would apply to manœuvres under sail, but there are supplementary evolutionary signals which specially apply to squadrons under sail. Now as it would be unadvisable, and is perhaps unnecessary, to enter more at large upon these various kind of evolutions, than by some examples in a few cases, I will confine myself to suppositionary evolutions. First, the line a-head in single column, which is the most convenient and usual form for proceeding out of port, and which Admiral Warden always adopted when taking the Channel squadron out of the Tagus.

Let us suppose that he desired to alter his formation into a line abreast, continuing on the same course: this would naturally be carried out by the ships astern steaming up at full speed to form on either or both sides of their leader, according to signal; then should he desire to form from line abreast to single column in line ahead, and at the same time to alter the course of the squadron 8 points, either starboard or port, this evolution would be readily carried out by the Admiral making a signal to alter course simultaneously 8 points to starboard or port

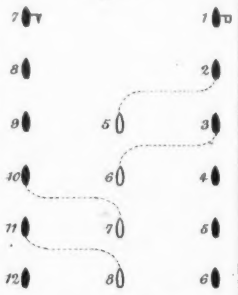
To form Line ahead from Three Columns.

Fig. 6.



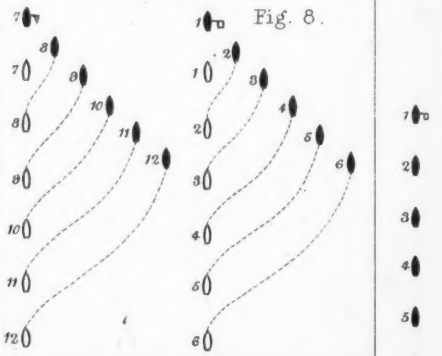
Change from 3 to 2 Columns.

Fig 7.



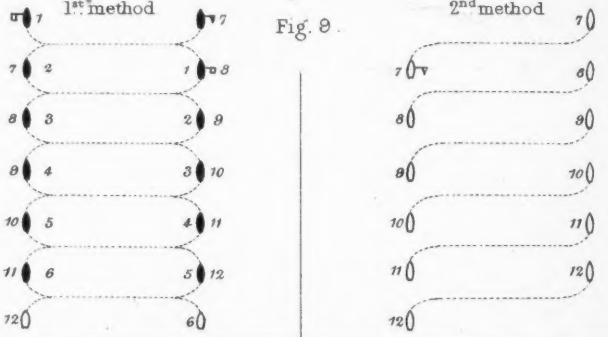
Change from 2 Columns to Oblique Quarter Line.

Fig. 8.



To interchange Columns.

Fig. 9.



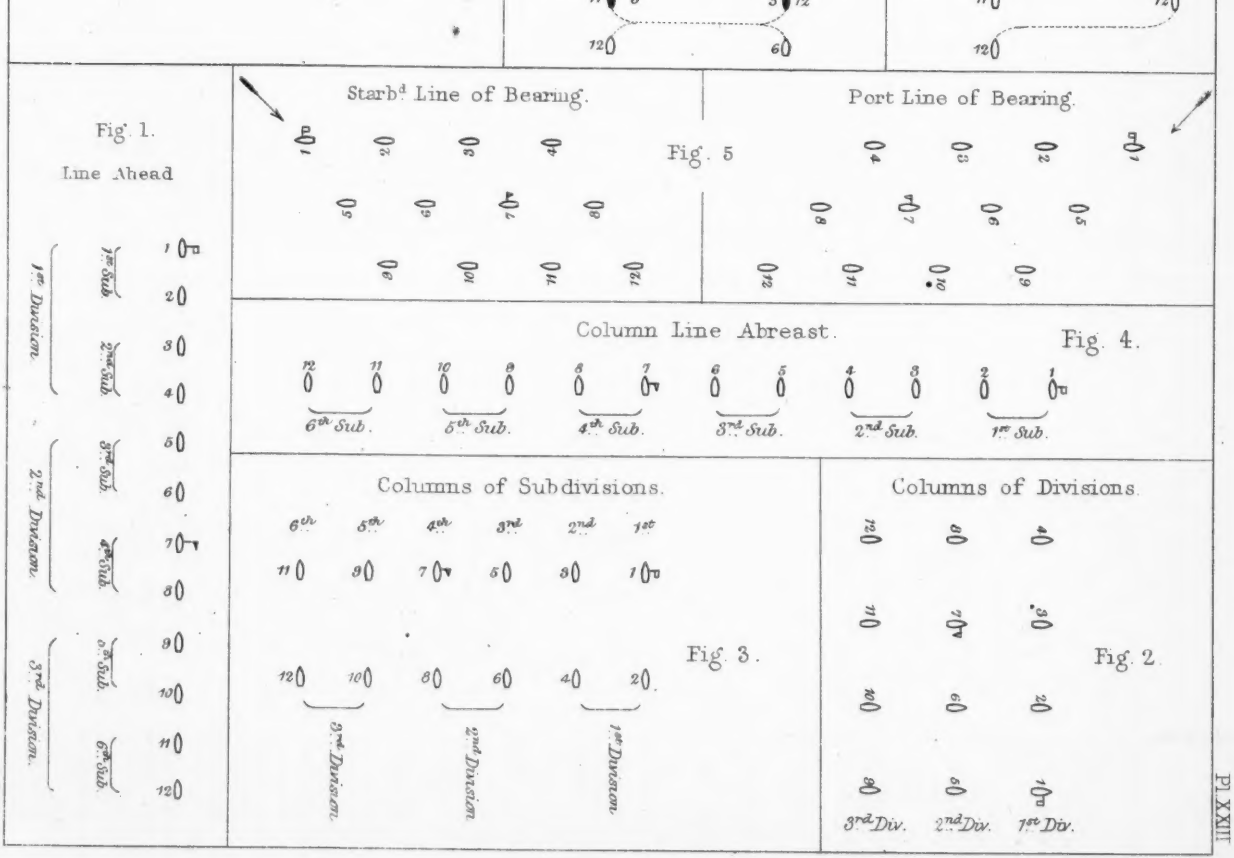


Fig. 1.
Line Ahead
1st Division
2nd Division
3rd Division
1st Sub
2nd Sub
3rd Sub
4th Sub
5th Sub
6th Sub
Starbd Line of Bearing.
Port Line of Bearing.
Fig. 5
Column Line Abreast.
Fig. 4.
6th Sub.
5th Sub.
4th Sub.
3rd Sub.
2nd Sub.
1st Sub.
Columns of Subdivisions.
6th 5th 4th 3rd 2nd 1st
Fig. 3.
3rd Division.
2nd Division.
1st Division.
Columns of Divisions.
Fig. 2.
3rd Div.
2nd Div.
1st Div.
J Jobbins
Pl XXIII

However, this would necessitate in one case an alteration of the Admiral's position to the rear of his squadron, instead of the van, and so to regain his post without altering the direction in which the ships were moving, he would hoist the signal to reverse the line and thus complete the manœuvre. There would be variations of this first formation in line abreast of single column, with regard to the position of divisions a-head or astern of the Admiral, or with the Admiral in the centre, and the same will refer to columns of divisions, whether two, three, or four, both in line abreast and in line a-head; also in columns of subdivisions; but in all these formations the fleet numbers must be carefully considered with reference to the positions the ships are to assume. There is another consideration which must enter into the formation of a squadron when under sail, and that is the line of bearing. The signal for this evolution will be understood to mean that ships are to place themselves with respect to one another on that compass bearing on which they would sail when close to the wind, on either tack in formation ahead (see Plate xxiii, fig. 5).

It must always be borne in mind that bearings and distances of ships in columns are to be taken from the leader when in line a-head. Starboard wing ship when in line abreast, from the most advanced ship when in quarter line, from the ship at the angular point when in two bow or quarter lines, and from the weathermost leading ship when sailing on either starboard or port line of bearing.

The second class of evolutions which is changing from one formation to another, deserves our next consideration, and it is to these I would desire especially to draw attention.

The new code of evolutionary signals is based upon a principle analogous in some measure to that employed for the movements of bodies of men in the field; this has been not inaptly styled the rectangular principle, and thus nearly the whole of these evolutions are made by making one or two rectangular movements to change the formation, in other words, to alter course eight points to starboard, and then eight points to port, and *vice versâ*—of course by divisions or subdivisions in succession or simultaneously, according to the evolution required.

I will take an example to illustrate my meaning. The Admiral having come out of port in single column line ahead, desires immediately to alter this formation of his Fleet, from single line to columns of divisions in line abreast, by turning to port. The signal being hauled down (which is always the sign that the evolution is to be commenced) Fleet numbers Nos. 1, 4, 7, and 10, as shown in the diagram (Plate xxiii, fig. 1), will turn together eight points to port, followed in their wakes by the respective ships of their divisions—a particular flag which is always used upon these occasions by the leaders of divisions regulating the movements of their own divisions. When the whole Fleet is thus divided into four divisions, steering eight points to port of their original course,—but now in line abreast,—the whole of the ships return to their original course simultaneously, and thus the evolution is completed.

There was no evolution of this description in the old code of 1859

though, of course, such a formation as the above could have been made by a series of signals and corresponding movements.

Let me take another example, which will compare with the old system. In that code, when the Admiral desired to form single column in line a-head, ships being in line of bearing or in line abreast, and formed in three divisions or columns, (see Plate xxiii, fig. 5), Nos. 1, 5, 9, Fleet numbers leading; the centre continues its course at slow speed, or small sail; the starboard or first division would alter course by bearing up under steam or under all sail, to arrive ahead of the centre division, and the ships of the third division or rear squadron would tack if under sail or alter course under steam, so as to arrive in the wake of the centre squadron. Now let us take the new code (see Plate xxiii, fig. 6) and propose to perform the same evolution: the ships of starboard wing column, or first division, continue on their course, and those of the remaining columns of divisions turn together to starboard, and, *preserving their formation*, resume the original course, so as to arrive in the wake of the leading column.

I am not at liberty to make allusion, except in a general way, to the evolutionary signals or the forms by which they are carried out, but I will suppose one more case to illustrate how a change from three divisions or columns to two divisions would be effected.

In practice it is found more convenient to break up the second or centre division, and the evolution would be performed in this manner (see Plate xxiii, fig. 7):—The headmost ships, Fleet numbers 5 and 6, would turn eight points to starboard, and when arrived in the wake of the first division, would then resume their course by turning eight points to port. At the same time, numbers 7 and 8 would turn eight points to port, and when arrived in the wake of the third division, would turn eight points to starboard, and thus complete that evolution.

The whole of these evolutions being performed upon a principle which, if borne continually in mind, it will be found comparatively easy to determine at once what is necessary to effect any alteration in the formation of the Fleet the moment a signal is made.

The next class of signals under the head of "Changing Direction of Columns," allude especially to the bow and quarter line formation, which may be at the desire of the Commander-in-Chief, 4, 5, or any other number of points to suit his purpose, and one, two, or three divisions may be thus disposed, and these may be on the starboard or port quarter of leader, or the *whole* may be ordered to form on the bow and quarter of the leading ship (Plate xxiii, fig. 8). Another variation of the same form, and which has found some favour of late days, viz., *the wedge shape*, is readily produced by the signal to form starboard and port quarter lines on the leader.

If while the ships are in this position the Admiral desires to alter the course of his squadron eight points without altering their formation, he would make signal to that effect, and the evolution would be carried out by the leading ship altering her course the required number of points, and those on her two quarters gradually decreasing and increasing their speeds, so as to come to their required positions with as little delay as possible, but should he signalize that the course of the Fleet

was to be altered simultaneously eight points, you will observe that in this case the entire figure would be changed, and in practice I found that when this was tried, if even one ship got out of position, with regard to the rest of the squadron, it was very likely to throw the whole Fleet into confusion, particularly if in close order, and it was very puzzling to say where that ship ought to go, the appearance of their relative positions being so much altered.

To assist the Officers of the watches, and indeed myself in such cases as that suggested, I devised a tactic board, which I have brought here this evening, and a larger copy is exhibited to illustrate its uses. Let me refer to it for this example (Plate XXII, fig. 3):—Here is the position of the squadron in wedge shape formation—steering north: now the Admiral makes the signal, "alter course *in succession* eight points to starboard," by turning the centre-board eight points, the formation, it will be seen, is unaffected, and though the bearings from each other are altered in name, the *relative* bearings remain the same—the squadron steering east.

The signal now "to alter course, together or *simultaneously*, four points to port," changes the whole aspect of the squadron (see the light outline of ships in the figure), and if Fleet number 8 should get into difficulties, without reference to some such diagram-board as this, he is likely to hesitate as to his proper whereabouts, and in the mean time he might mislead others. Now I will suppose another change. "Alter course together ten points more to port," and now the variation is again easily adjusted by the reference to the board; "two points more to port" and the squadron is formed in the figure known amongst naval tacticians as "Cornwallis's retreat." Whilst upon the subject of this board I may say that all evolutions are very much assisted by a continual reference to the diagrams, which are altered on the board, the little cardboard vessels with fleet Nos. being fixed with pins, at each change of signal are shifted with facility, and it then becomes a guide to the Master or Officer in charge.

The lines crossing each other at right angles in the revolving centre-board are supposed to be at two or four cables apart, as most convenient.

On the margin of the square board are marked the compass points, and the blank space is filled up with a few maxims of moment.

The "course of the Fleet" may be altered, as shewn in the last figure, from one to sixteen points whilst retaining position; by due reference to bearings and distances, there are some refinements by which the new figure may be more rapidly attained, but which it is hardly necessary to allude to here.

All the usual signals for keeping in close or open order, nearing the Admiral or a particular ship, and in assigning or altering stations, are coded together, so little difficulty is experienced by him who directs or those who obey, in referring to the new signal books.

Amongst miscellaneous evolutions was one (often practised in the Mediterranean) for changing columns or divisions, whereby the starboard or weather column was made to become the port or lee column. This was effected by the leaders of each column, followed simultaneously

by the respective ships of their columns, putting their helms over at the same moment, so as to pass one another on their port sides, and having thus crossed each other at midway between their original distances, returning back to their first course, so as to assume the same distance of columns as that established before the evolution. (See Plate XXIII, fig. 9.)

Another mode of performing the same interchange of positions can be effected by one column going astern of the other, and when all are in line, then the other column would alter its course, and take up the position originally occupied by the first. When a squadron or fleet is formed in close order, and evolutions are being rapidly performed, any casualty to a single ship, either in her engine-room, or with her steering gear, may prove of great inconvenience, if not danger, to other ships, unless timely warning be given. Of course the Commander of such vessel would immediately communicate to the Commander-in-Chief by signal that he was disabled; this, however, would take some time, and vessels in the immediate vicinity would run some risk of collision. This sort of accident occurred once to the "Royal Oak," in the Mediterranean squadron, while we were in close order. Her tiller ropes carried away, she was at once unmanageable, and the ships in company wondered at her erratic motions.

Now I would suggest that it should be a standing order in a Fleet, that when anything of this sort took place, the ship thus disabled should immediately turn on her steam whistle, and keep it sounding as a warning to the rest of the squadron, until she was clear of all dangerous proximity.

Lord Clarence Paget was in the habit of assembling the Captains of his Squadron on board his Flag-ship before evolutions, and after they returned to port, and sometimes when the weather was suitable at sea, to receive suggestions from them, and remarks upon the exercises they had been performing. I think that considerable benefit to the service accrued from this interchange of experiences.

There was another custom in the Mediterranean squadron, instituted by the Commander-in-Chief, which, though it has nothing to do with "naval tactics" in the general acceptation of the term, I think may be quite worthy the imitation of others. On our days for shot practice at a target with great guns, a floating target used to be towed astern of the flagship at a convenient distance, and the ships of the squadron were directed to range up in succession at the number of yards indicated by signal, and thus deliver their fire at the mark. The Admiral could then observe from the poop of the ship the precision of firing from each vessel, a quick-sighted Officer noted every shot, and a table of the result was afterwards lithographed and circulated in the squadron.

In the Channel Fleet, Admiral Warden adopted a plan of exercising with the steam launches, a very useful and economical way of instructing the junior Officers in "naval tactics."

Should the opportunity ever occur for assembling a flotilla of gunboats in the Channel for similar exercise, I believe much instruction might thereby be gained, and if Officers on half-pay might be allowed

to take that opportunity of "keeping pace with the times," there would be numbers who would doubtless gladly avail themselves of the occasion.

I fear I have extended my paper already beyond the usual limits of an evening reading, but I can hardly close without an allusion to that mode of fighting at sea which must be a very marked feature in all future naval engagements. It will be readily understood I allude to ramming an enemy. The preparation of a ship when going into battle with the view to receive or impart blows, would be the first consideration, and there would be the proper arrangement of top-gear and bowsprit. I cannot particularize these preparations without infringing on the matter contained in a confidential report, which, with other Captains of the Fleet, I was required to forward to their Lordships; but here will be more properly discussed, and I hope my brother Officers will offer opinions upon this matter, as to the best formation of a Fleet to receive the shock of an enemy's rams, or to act offensively in this fashion.

There is no signal or diagram which shows how a Fleet could be readily placed in the form which it occurs to me would be the best when not taking the initiative, but let us suppose the Fleet was formed in *two* columns or divisions in open order steering north, and on starboard line of bearing.

The enemy are seen coming down on the port beam. If the Admiral were to make the signal "alter course together, 8 points to port," the result would be a double line abreast, which in effect would appear like a single undulating or deeply serrated line, there would be a sufficient distance between the ships to admit of each vessel being steered so as to avoid the enemy's rams, and at the same time they would be in the best position when the shock was over for returning at once to their original course, and pouring a raking fire into the enemy's sterns. Again, if the British Admiral desires to take the initiative, then I should suggest the wedge formation in *three* or *four* divisions, according to the numbers in his Fleet, and I fancy this would prove the best form for dividing an enemy's squadron.

In closing these remarks upon "naval tactics" of the present day, I must again reiterate that I do not pretend to advance much that is original, but rather to quote experiences, and to invite discussions, the former not altogether without use, if only to give basis upon which argument may be encouraged and opinions elicited.

Commander COLOMB, R.N.: I do not know that I can better sum up at the commencement of my remarks my impressions of the paper we have heard, than by saying that I believe Captain Inglefield has said nothing in which I do not thoroughly agree with him from first to last; therefore, as to offering any criticisms, I, of course, have none to offer. I agree with him in the remark he made at the commencement of his lecture, that Naval tactics are a *science* and must be made a *study*, and it must the more be made a *study*, because in the nature of things the practice we can get with ships at sea will be confined to a small number of Officers. On the outbreak of war, however, the whole Navy may be suddenly called on to deal with questions of large fleets, therefore, those Officers who have the leisure to do it, should make a study of the theory of the subject, in order to be ready when the time comes for the practice. I also quite agree with his remark, that in making steam the basis of your tactics, you should not omit the consideration of working your fleets under sail

on the same principle. As to the position of the Commander-in-Chief, I also again agree with him in thinking that the Commander-in-Chief must in these days be free from the trammels of keeping in a particular position; he must be allowed to take his position wherever he thinks proper, without running any danger whatever of throwing out the movements of the fleet, or being supposed to be the real point for concentration. With regard to the use of "rams," it is quite a sign of the times that since I had the honour of being the first (I think) to bring forward the subject in this lecture-room, some two and a half or three years ago, five or six Officers have spoken, just as strongly as Captain Inglefield has, in their favour. I have no doubt whatever in my own mind that the "ram" is to be the weapon of the future for naval attack and defence. The question is, whether the "ram" will be most efficient for opening up the attack, or, as the bayonet is on shore, for the finishing touch. I think, myself that the proper time to use the ram is at the commencement, because I look, not so much to the material effect of the ram, to the number of ships that may be destroyed by it, but to its moral effect—the amount of nerve-disturbance created in a fleet by the chance of being rammed; and I should wish to produce that nerve-disturbance as soon as possible. After the fleet is well engaged, it appears to me that the opportunity for ramming will not be great, because you must have speed to damage a ship seriously with the ram; and when the fleet is in the *melée*, any outside ship coming as a ram would have more or less difficulty in picking out, in the smoke, the object that she is going to attack. But at the commencement of the action, where half a dozen rams are despatched in front, of course they have nothing but the enemy before them; they cannot hit a friend, they have nothing to do but to go straight on. It has been a gratifying circumstance to me to hear Captain Inglefield speak in such favourable terms of the new signal books, I having had a little to do with them. Of course it was a labour of considerable difficulty, as every naval Officer will allow, and it is a satisfaction to know that Captain Inglefield's opinions are, I believe, generally held by those Officers who have had experience of them, and it will be gratifying to Sir Sydney Dacres to know that the course he recommended in reference to this troublesome question has resulted in a successful issue. I think the exercise with buoys—making ships turn in the figure 8—a first-rate arrangement. I do not know any other plan whereby a Captain could get sufficient knowledge of his ship's turning powers to the same extent as by this arrangement. Properly speaking you require for tactical purposes to work with other ships, and to compare your turning powers with theirs; and until you have thoroughly mastered the turning powers of your own ship *per se*, you are hardly in a proper position to determine her relative turning powers with those of the ships near.

I am sure all the members at this meeting must have been struck with the number of new terms that have been imported into the signal book. Captain Inglefield is evidently very familiar with them, but I am afraid many members who have not had the same experience, may have found a difficulty in following him; the fact is that the whole of the old terms have been at once swept away; it was found impossible to keep them. As regards the angular formation and the confusion which has been found to occur from one ship getting out of the formation, *that* was a point which we discussed at a former meeting, and we decided that the angular formation, for that reason, should not be assumed except with a squadron which was thoroughly trained in the use of it. It is doubtless a very good formation for some purposes, but it is extremely difficult to retain and to manœuvre in.

Captain HOUSTON STEWART, R.N.: As Captain Inglefield wishes to invite discussion, I should like to get an opinion expressed as to this "ramming." We will suppose that in case of war the English fleet will not be composed of the same material as the fleet with which Lord Clarence Paget, with his well-known ability and zeal has attempted to carry out steam-tactics, because it is idle to talk of perfect steam-tactics with vessels of different powers, including the three-decker and the small corvette. But we will suppose that the ships which are going to receive these ram-attacks are ships of equal power and equal speed, and are as capable of as great speed as the fleet that is going to attack them. If it is the French Fleet, we know that every ship will be exactly alike, and that their speed will be the same, consequently the Captains of those vessels will have no difficulty in keeping their relative

positions in making the attack. We hope and expect that it will be the same with the English Fleet. One fleet comes down at 10 knots, and the other fleet goes at 10 knots. How is the fleet that is moving at 10 knots to ram the other fleet that is also moving at 10 knots? I do not understand it. I do not understand why I should be rammed if I am going 10 knots and the other man is coming down on me at 10 knots. The only two distinct cases of ramming that we know of between ships, were those of the "Merrimac" and the "Monitor," and the ramming of the "Tennessee" in the action off Mobile. In the latter case the ships rammed and retreated, and came on again, and we are told that the effect was to strike the men down at their guns, and the result was the capture of one of the vessels. Those were cases in which both parties wished and tried to be rammed. But I can hardly understand how two fleets composed of vessels of equal speed and equal material can begin an action by ramming one another. I have not clothed this in elegant language, but Captain Inglefield has expressed a wish that the question should be discussed. There is only one other remark I should like to make. Of course the two great elements of success in a steam navy are a well-considered and well-devised system of steam-tactics, and also that our fleets and squadrons should be composed of such material that they can work effectively under steam. That point does not rest with the Officers of the Navy, but with those who direct our councils. I hold that every Commander of a fleet, and every Captain of a single ship, if he possesses the signal book, has it in his power to bring himself, his Officers and his men into practical acquaintance with a universal system of steam-tactics in the Navy. Many of us remember the time when our Navy had no universal system of gunnery, when every ship in the Fleet had her own system of gunnery, and it was a question whether we should have a universal system of gunnery. That is all over now, every ship in the service has the same system of gunnery. And why should we not have a universal system of steam-tactics. We have our experimental squadrons; why cannot there be a day in the week when our Officers can be assembled in the cabin with the Captain and put through all the tactics, so that every Officer in the ship may learn every signal and every manœuvre? The thing is as simple as possible if we had a well-devised system of tactics. I hold it is a most important vital point, that every Officer in the Navy should be thoroughly instructed in the theory of steam-tactics; that must be the first thing.

Captain FREMANTLE, R.N.: In the presence of so many Officers of superior rank, who have had more experience in most matters connected with the service to which I have the honour to belong than myself, I feel some diffidence in asking any questions. But I should like Captain Inglefield, before he replies, to be kind enough to give us a little information on some subjects which I did not quite understand from his paper. In the first place, we know that there are new steam-tactics, to which Captain Inglefield alluded. But I for one, am not quite clear whether in those evolutions of which he spoke, they were performing those new steam-tactics which are at present in the signal book, that Captain Colomb had something to do with, or whether they were steam-tactics which Lord Clarence Paget was trying of his own, or were suggested to him by other Officers. Now I am not an old Officer, but I have had some experience in signals, and I am very sorry that Captain Inglefield was not at liberty to allude to them more than he has. The whole question of steam-tactics depends very much upon a matter of detail. I may remark in passing, that it has been too much the custom to leave signals almost entirely to the Signal Officer, or, perhaps, to the chief signal man, who is necessarily quite unacquainted, as a rule, with the real theory of tactics. It may be urged that it is a division of labour, but, at the same time, it very often causes confusion, for the Officer who gives the orders knows about tactics, while the man who carries out the details knows only about the signals. One of the commonest questions in fleet evolutions used to be, what is the "starboard line of bearing?" I did not quite understand Captain Inglefield's explanation of that. My impression is, that "the starboard line of bearing" by the old signal book was, that every ship should be in such a position, that on hauling to the wind on the starboard tack, and altering courses together, they would be in line of battle on the starboard tack. The converse would be the case with the port line of bearing; the ships being in line of bearing, no matter what position they bore from the Admiral, if they hauled to the wind together

on the port tack, they would be in line of battle on the port tack. If that has been altered now, if the starboard line of bearing means something different, as I understood, I should like to have an explanation of it, because I think it makes a great difference in the question of steam-tactics. I have undertaken, to a certain extent, not the defence of the old system of tactics, because I do not think they were at all applicable to the present day, but I think it has not been stated quite fairly. For instance, the wisdom of our ancestors was greater than to allow of only one method of line of battle, as one might have supposed from the diagram on the wall. You can form a line of battle in three different ways, or even in more than that, according to the old signal book. There were diagrams at the end of each signal; you could form on the van, you could form on the centre, and you could form on the rear. It would appear by that diagram, as if by the old signal book you could only form on the centre. (No.) I am informed that that diagram is only a representation. I would only repeat, that by the old system you could form line of battle on the van, and the Admiral might lead the van if he thought proper to do so. In changing divisions, one division to go across to the other side, and form the other division, that is to say, the starboard division to form the port division, and the port division to form the starboard division, as Captain Inglefield explained it, I should like to know whether, in the new signal book (I believe they call them now, first and second divisions), they change places, whether they alter their names or not. I have thought it right to ask those questions, and I hope they are not out of place.

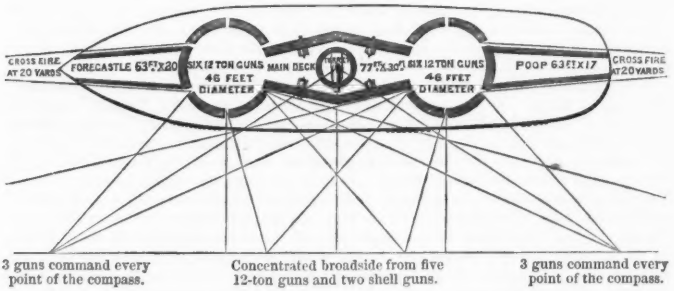
Captain INGLEFIELD: To take the gentlemen who have made remarks upon my paper in the order in which they have spoken, Captain Colomb alluded to the Admiral's position in the Fleet of which I spoke. It is due to him to say that it was only this afternoon that the Secretary of this Institution lent me his paper on the Battle of Lissa; this I had not seen before, as I was abroad at the time it was read. In it I remark that he exactly adopted the notions that I have stated. It is right I should say that I am not the first person to suggest that the Admiral's position should be an independent one with regard to the line of battle. With regard to "ramming," Captain Colomb's remarks only referred to those which I made, and with reference to the difficulty of ramming. But as the ramming properties of ships, and the use of rams in a squadron, have been alluded to by another Officer, I will take that subject up by saying that I perfectly agree with that gentleman when he told us that it would be very difficult for two squadrons, coming at the rate of ten knots, to ram each other, very difficult for them to strike each other exactly. It is for that very reason that I suggested that the rams should be brigaded together, to act when the enemy was paralysed, either by some disaster, or by "the first shock of battle," which was the expression I made use of; and that it is then I believe the rams will be more useful than if they were to be the leaders of the Fleet. At the commencement of the action, every ship being in her best trim, having her full power, and able to steer perfectly, it will be very easy to my mind to avoid the blow of any ram that is clearly directed towards your ship. But, on the other hand, when a ship has been disabled or paralysed by a broadside, or by something which has happened on board of her with the first collision, it is then that I think the ram, not having been engaged, in a perfectly cool,—almost cold-blooded manner,—may run steadily into another vessel, because she has all the chances on her side, while the other is comparatively helpless. There I agree with that gentleman, and I agree with him in saying that the rams ought to be placed in the rear of the squadron. Another gentleman remarked that it is hardly fair to talk of the "Gibraltar" and the "Victoria" as fair examples for exemplifying the working of a line of battle. The "Victoria" was changed, before I left the squadron, for the "Caledonia;" and we had at last a very fair number of iron-clads with which our evolutions were carried out. We were out, I believe, on three or four occasions when every signal which our old signal book contained, was practised; not once or twice by the Admiral, but several times. With regard to the old signal book, I may say that the Mediterranean squadron had only the old signal book; while the Channel squadron was purposely sent out to practice the signals in the new signal book. My ships,

the "Prince Consort" and the "Royal Oak," were detached from the Mediterranean squadron and attached to the Channel squadron on purpose to make an efficient iron-clad fleet. In the Mediterranean squadron we had the opportunity of testing the old code of signals; in the Channel squadron we had the opportunity of testing the new code of signals. Being the leader of the lee division on both occasions, I had the fullest opportunity of seeing both systems thoroughly tested. The practice of naval tactics ought to be carried out whenever an opportunity occurs. Having been on one or two occasions desired by the Admiral in the Tagus to take out the steam-launches and go through evolutions in the open waters below Lisbon, I found it was an admirable way, and at a cheap rate, of teaching the younger Officers to practise Naval Tactics. It was with that experience that I suggested how convenient it would be to allow Officers on half-pay to assemble on board gun-boats at Sheerness or Spithead, and give them that experience in evolutions which had been gained by those who were in the Channel squadron. With regard to the line of bearing, the meaning of the expression, "the line of bearing," has not been altered in the new signals. It remains exactly the same as in the old, and is exactly the same as described by the gallant Officer who spoke upon the subject.

The CHAIRMAN: It remains with me to say a few words before I convey the thanks which I am sure the meeting will give to Captain Inglefield. In all that he has said about the necessity for instruction in naval tactics to us who are on shore, I fully agree. I think it is quite necessary that we should learn whilst we are upon shore. Of course I am speaking for others, as well as for myself; and to those who are young I consider it a great advantage indeed, to have the opportunity of hearing an Officer, fresh from such drilling as Captain Inglefield has gone through, with so much intellect on his part,—I say it is very advantageous indeed, that we should all of us be able to learn from such an Officer our lesson here in peace, which, shortly, we may have to practice should we go to war. I must also say another thing, namely this, that when war does come, it will not be mere theory. Of course, many things will be adopted roughly in practice which we have hardly imagined in theory; and among those evolutions which are done very well on paper, some may be quickly done, and some may be done by the rule of thumb far better than by right angles. But I feel convinced that the Fleet that is most practised in evolutions will be the one that will be best in position to fight its battle. It is coming back, as we must come back, to original ideas. We must remember the Roman word for "army" signified "exercise." So it is with the "fleet," our word for a "Naval Army," we ought to be exercised and drilled continually; and the Fleet which is most thoroughly drilled will, in the day of battle, be the best, as far as that goes. That diagram (Plate XXII, fig. 3) seems to me to be an excellent thing. It is an easy way of putting into the mind of the Officer of the watch, at a moment's notice, that which it is his duty to do instantly; because he must act instantly in many cases, putting his helm one way or the other, before he can send down to the Captain. He requires a reference to the diagram. If he has not got the movement in his mind beforehand, of course the ship may suffer and he may suffer. That diagram will enable him to put the ship into position at once. I think it a most excellent improvement. With respect to the position of the Admiral, every person must have his own opinion upon these subjects. My own opinion, as an Admiral who has pretty well passed the service, is that the Admiral must certainly be detached from the actual line; he must be able to move every-where. But he must also not be in a tender or anything inferior of that kind; he must be in a swift, first-class ship, because it is not only that he has to direct, which is his first duty, but we must remember that on him devolves much more than that, he has to set the example when it comes to that *melée* which has been spoken of. He may send his squadron into action, but he is the person to show the squadron how to go into action, and to do it himself. He must be the person who must lead the reserve in the crowning attack; he must be the person, as soon as he has prepared all the manœuvres to win the battle, who must go into it himself. He must do some-thing more than look on. The signals in action will be very few, indeed. In our old naval actions, where, Heaven knows, they had time enough to think of these things, we find the signals made during the action amounted really and truly to only two or three. If that was the case where there was only the smoke of the guns, and

not the smoke of the engines, what will it be in the present day, when ships are moving with wind and steam, 10 and 12 knots at each other! The whole thing must be settled beforehand, and then the Admiral must trust to the individual exertions of his Captains after he has made his general dispositions. There was another point mentioned about "ramming." I do not quite agree with Captain Inglefield, about putting the rams so far astern. I have not the least doubt that there will be very great difficulty of ramming in the first line. But supposing an Admiral puts his ships in two efficient ramming lines, I believe the second line will be the one that will ram. The first attempts that will be made will result in confusion and *melée* between the two first ships that grapple; and it is those that come up immediately afterwards that will be able to act upon those which are still unscathed, but have lost their way; that is the time for ramming. But I think the time for ramming will be partly gone, when ships are totally disabled. If one ship rams another, she is in the greatest danger herself from the second astern of the ship she is so ramming. I do not wish to detain you any longer, but I think we must return our best thanks to Captain Inglefield for the admirable paper he has given us. It is an admirable lesson for us all. As an Officer of the old school of tactics, I think it is a very great lesson to learn from a junior Officer who has recently been employing his mind and his talents so well as he has done.

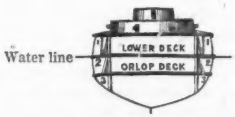
Captain Edmund Wilson, R.N., explained models illustrating the construction of an armour-clad ship of his invention. Her length 300 feet, beam 64 feet; armament thirteen 12-ton guns in turrets; and four shell guns 8 feet in length, and 11-inch bore; three guns commanding every point of the compass.



3 guns command every point of the compass.

Concentrated broadside from five 12-ton guns and two shell guns.

3 guns command every point of the compass.



Transverse section.

1. Upper compartment, with the armour sloped to 22° and showing chain mantlet. 2. Lower compartment wholly under water, armour sloped as above, and then closely packed with cork. 3. Coal bunkers.
Draught of water, 24 feet.
Equipment: A full-rigged ship.
Engine power: 1,000 horses.

Captain Inglefield: Is that auxiliary rudder which I see in the model before the screw?

Captain Wilson: Yes, before the screw. If you want a ship of this length to come round very quickly you would use the auxiliary rudder.

The CHAIRMAN: The principal advantage of your system is putting the iron on the inside, and the wood on the outside of the vessel, as if she were a wooden ship?

Captain WILSON: She is a composite ship, with iron inside, and wood outside in contact with the water. She has thus all the rigidity of an iron ship, with the advantages of a wooden ship, as far as relates to her bottom keeping clear of weeds, &c.

The CHAIRMAN: What would be her power of ramming? Does she ram with an iron or a wooden stem?

Captain WILSON: The stem would be of wood, protected with an iron face; this part [pointing] would be filled in solid.

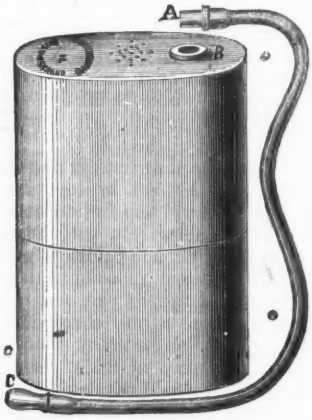
The CHAIRMAN: Have you thought of the accommodation inside for stores and men, for the habitat of the ship?

Captain WILSON: Yes, she has everything that a ship of the usual breadth has. My ship is 4 feet broader than one of her length generally is; she is in fact one ship inside another. There is one more point I should like to show you with regard to "ramming." In consequence of the form of her midship section, owing to her extra breadth, Mr. Reed's present ram-stem, as represented by this model, on striking her, would not, as you see, take the bilge at all. Of course the only part where a ram could do any damage, would be under the armour. With an ordinary ship, the ram would go right into her; but with this ship of mine, with external wood, and with internal armour, the ram would not damage her.

The CHAIRMAN: We are much obliged to you for bringing these models, and explaining them to us. I do not know that we should agree with you in all the details, and I regret that we have not more time to consider them, as there is a gentleman who wishes to show us a filter of his invention.

Mr. W. B. LORD, R.A.: The filter which I am about to show you, is the result of some little experience in roughing it in wild countries. It has so happened, that in the course of my wanderings, I have been placed in positions where the water was particularly bad; this induced me to turn my attention to make something that would constitute a rough and ready filter for men on service, for the explorer, the naturalist, and the emigrant, to have always at hand, to be able to use it for a variety of purposes, and by its aid to get water comparatively good for drinking purposes. The filter is simply a pint cup composed of block tin. In it a man can boil a little tea, as well as use it for ordinary drinking purposes. In it I carry a small tube,—this which I now show you, is of vulcanized india-rubber,—but those which I shall have made for issue, will be of leather. Vulcanized india-rubber, strangely enough, undergoes a sort of disintegration on being subjected to a tropical sun; why, is hard to say, because vulcanized india-rubber exposed to an equal degree of heat in an oven is not affected, as it is by the action of the sun; I shall therefore employ leather. When you want to use it, you

put the filter in the water, and on exhausting the air by suction you perceive that in a very short time I get a cup of clear water. [Mr. Lord exhibited this practically.] The water has to pass through a stuffing-box, which contains a small piece of sponge, little pieces



of woollen or cotton material,—even moss or powdered fibre from a tree will answer the desired end. When the stuffing gets soiled, you have only to take it out, wash it, and put it in again. There is in the filter a little hollow constituting a kind of grating, which I call grating No. 1. After passing through it, the water has to pass through a second. Both these gratings are attached to the stuffing-box, which is filled with either hair, matting, wool, or cotton. Supposing you arrive at a deep pool, where it is difficult to get height sufficient for you to operate with it as a syphon, you have only to exhaust the air repeatedly to get as many pints of water as you want; but if you can dip the water up in a pail, and then exhaust the air, the tube will act as a syphon [showing]. My object in using sponge is to get rid of the insect larva, ova, insects, and the particles of decomposed and other matter which one finds in the waters of tropical climates. On many occasions I have had to make all sorts of makeshift filters. In the Crimea, I took a wine bottle, knocked the bottom out, put a piece of sponge into the neck, hung it up, and made the water filter downwards; that kind of filter, however, is inconvenient to carry about with you. Another way was to take a bunch of grass, twist it into a coil, turn it down, and allow the water to run in at the upper, and out at the lower end; but that was a rough system of filtering. Again, I used to get a piece of the ordinary cloth of the country, put it loosely over the top of a

pot, and pour water through it. With this new filter I shall have no such difficulties. I should carry it in one of my holsters, or in my pocket, and it would be always at hand for use.

The CHAIRMAN: Is there any charcoal in that filter?

Mr. LORD: There is no charcoal in this; but I should recommend, where you really have very bad water, that a common bag or net of charcoal should be put into the pail when you can carry one. Nearly all those filters which are made with the view, as it is supposed, of freeing water by chemical disinfectants, must as a matter of necessity, be very slow in their action; for until water is subjected for some considerable time to the action of any antiseptic, it cannot be influenced by that antiseptic. It is not simply the running of a stream over charcoal that frees that stream from impurities; it is the long-continued contact with charcoal that frees it. Therefore, where you have a vessel which you wish to fill instantly on the march, charcoal would not do that which the public supposes it does; it has not time to do it. I quite admit, that if you have a large vessel filled with charcoal, and it has time to act, it would be very desirable, but when you are on the march, and want a draught of water at a moment's notice to save life, you will not find charcoal of much use.

Captain COLOMB, R.N.: What is the cost of your filter?

Mr. LORD: It may cost possibly a shilling or eighteen pence for one made of block tin. I think the original one I made, cost me fourteen or fifteen pence; it was made of common tin soldered; but I should recommend those made of block tin as being the most serviceable.

Major-General BOILEAU, F.R.S.: It appears to me that the invention submitted to the meeting is one well worthy of general introduction. It is not the first portable filter made use of, because a large number of carbon filters were made and sent out to India for the use of the soldiers. They were made much in the same way as this; there were blocks of composition, to which there were long tubes attached; they were thrown into the water that was often very dirty, and by suction, water was produced that was drinkable. The great advantage of this filter is, not only its simplicity, but the very many purposes to which it can be applied. Of all similar filters of this kind, it appears to me that while they supply one of the most urgent requirements of man in a hot climate—a draught of water that is wholesome to a certain extent—none of them chemically cleanse the water from that which is prejudicial to health. Of all that I have seen, there is not one that answers the purpose so well as the one which has been explained to us this evening.

Captain BURGESS: Colonel Beauchamp Walter, who has served in India, and to whom I showed that filter, thought it of the highest value, and that every soldier should be supplied with one of them.

The CHAIRMAN: I am sure the meeting thanks Mr. Lord for having brought this filter to our notice.

LECTURE.

Friday, May 22nd, 1868.

GENERAL SIR WILLIAM J. CODRINGTON, G.C.B., in the Chair.

ABYSSINIA.

By MANSFIELD PARKYNS, Esq.

MR. CHAIRMAN, LADIES AND GENTLEMEN,

WHEN the compliment of being asked to give a lecture at this Institution was paid me, I was in some difficulty as to the subject matter I could offer. There is nothing in the military tactics of a semi-savage race. The British expedition now in the country seemed the only topic appropriate to the Royal United Service Institution; and that I felt was a field on which I could hardly venture, as I could only offer matter that had already appeared in the public press, not having travelled over the exact route to be followed by our troops.

A member of the Institution, however, kindly suggested to me the course which I shall endeavour to follow, namely, not to interfere with that most interesting topic, but to consider it my part merely to give a sort of introduction to a lecture, which it is to be hoped will, before long, be delivered by some Officer who accompanied the expedition.

My matter will therefore be rather ethnological than military. I shall attempt, so far as limited time and ability will allow me, to give you a general idea of the country and of the people we have to deal with, leaving to some one better qualified the task of telling you how we have dealt with them. I may venture, however, to say that the events which have lately occurred, fully justify what I wrote of the prospects of the expedition at the beginning of the year: "commanded "as it is, whatever can be done, will be done." And I am sure that when we have full details of what has been done, it will be agreed by those most competent to judge, that though we have not had a chance of winning much glory in actual fighting, we have done wonders in the equally important matter of moving a large force through a most difficult country.

As to Theodore's conduct, I may again quote myself, when I said

that it was impossible to calculate on anything, where "so much "depended on the whim of a self-willed, daring, and obstinate half-"savage." But in those words I hardly conveyed what I meant. Had he been an ordinary savage, one might have made a pretty good guess at what he would be likely to do. But I had heard so much of the wild, almost insane way in which Theodore sometimes acted, that I felt that no reliance could be placed on any estimate of him, founded on general knowledge of the ways and motives of his countrymen. Once, I did venture to speculate, and lost. When the news arrived that our troops had reached within a few miles of Magdala, without having met with any opposition; that the prisoners were better treated, and Mr. Rassam freed from his bonds, I confidently asserted that Theodore would come out and meet Sir Robert Napier with open arms; express his gratification at the high honour done him by his dear friend Queen Victoria, in sending him so splendid an embassy; invent 1,000 excuses for the past, eat any amount of humble pie, and invite his Excellency the Commander-in-Chief to join him in doing the same by any amount of raw or broiled meat. Had he done this,—and I know many a nigger who would have tried it,—I can't see how Sir Robert Napier would have acted, in face of the Government assurance that the sole aim of the expedition was to recover the prisoners, and that object being gained, not to interfere with the existing state of affairs in the country.

I cannot understand why Theodore acted as he did, and am still inclined to believe that he had no intention of fighting till the last moment, when he did so under the influence of some fit of passion or of drink. Possibly, however, he may have been so hampered by rebels as to have been unable to act otherwise.

As for Theodore himself, his real name was Carsai. He was born in Kuara, one of the westernmost provinces of Abyssinia, son of a man of no eminence or wealth, though claiming lineal descent from Menilek, the traditional son of Solomon the Great, and Maqueda, the lovely Queen of Sheba. After the death of his father, his widowed mother gained her livelihood by collecting *kousso*, the native remedy for a national complaint, while the future Theodore picked up his on the roads as a brigand. In such a career he was naturally subject to many turns of fortune; at times hiding away alone; at times leading a considerable band; till at last he gained such celebrity that a large body of men joined him, and from brigand he turned rebel, in which new career he met the troops sent against him so successfully, that the daughter of Rus Ali, then great chief of the Amhara country, was given him to wife. These sort of alliances have not, however, much effect in producing peace, which was soon broken.

Theodore's good luck never failed him, for when he ought to have been beaten, chance gave him the victory, and four years of continued successes left him sovereign by conquest of all the independent sovereignties of Northern Abyssinia. In February, 1855, he was crowned Theodoros, King of Kings, Emperor of Ethiopia, by the hand of the Coptic Bishop of Abyssinia.

I have seen it stated that he assumed the name of Theodore, in pious

gratitude, because God had given him the victory. I don't suppose he was aware of the meaning of the Greek word. He undoubtedly assumed the name on account of an ancient popular tradition that an Emperor named Theodore should re-unite the old empire, and restore its much-talked-of ancient glories. He rose and fell, for his fall seems to have begun before our intervention, as many other men have risen and fallen before him.

Kingdoms, if not the whole empire, as in his case, have been lost and won in Abyssinia from very small beginnings.

It is hardly a caricature to say that men have risen almost, if not quite, to what might be called a throne, at the small cost of *one dollar or thereabouts*.

So it was said long before Theodore was known to fame, and his career was like that of many who had gone before him.

The old saying was that a daring, active man, especially if he had the remotest possible claim to relationship with any former chief, had only to buy a small drum and hire a small boy to carry it, and from that commencement he might win a kingdom. First he would waylay and rob a few old women on the road to market, half a dozen men would join him on the strength of the loot; a farm-house plundered would add a dozen more; a hamlet would bring a score or more recruits, and so on in geometric progression till his small boy and drum grew into a formidable army, which would cling to him so long as he was successful, but desert him to a man, if by ill-luck he met with a reverse.

This is by no means so broad a caricature as it may seem of what has really occurred, or of the native character. I have always found it so, and was amused on my return by a great phrenologist pronouncing as his first opinion of a very faithful native servant of mine: "He will be very faithful so long as it is worth his while to be so."

When the news of Theodore's death arrived, I again fell into a mistake. I asserted boldly that he had not committed suicide, but in all probability had dressed the body of some man who had been shot either by him or by our people, in his clothes, and so made his escape in disguise. That would be a very likely trick for him to play, while nothing is so unlikely as for a native to commit suicide. I don't believe I ever heard suicide even spoken of, either in Abyssinia or the adjacent countries during seven years travels. But I was corrected, being told that the body had been identified by the captives. Supposing this to be the case, and that Theodore died shot, I should still have been sceptical as to whose hand shot him, were there not good evidence on that point; I should have thought it much more likely that some one of his followers, not being quite so fond of fighting to the death as his master was, shot him in order to stop matters. So we may take leave of Theodore as an exceptional character, so unlike the rest of his race that he will doubtless find a special biographer.

And now as to his country—Northern Abyssinia is for the most part a portion of an immense table land, in many places mountainous, but with mountains springing as it were from the summit of one large flat-topped mountain. Some of these standing isolated on the level, or

in groups, are of singular form, looking at a distance like immense towers built on the top of artificially raised mounds, so regular are some of them in form; but on nearer approach, one finds the tower to be a perpendicular-sided rock, often of great area, and the mound to be a mass of debris which has from time to time fallen from it. These are the "*Ambas*" or natural rock forts we have heard so much of, and of which Magdala is one. But though perhaps impregnable to native troops, Magdala cannot be compared to some smaller rocks for natural strength. There are some which can only be entered by means of ropes let down from above.

The following story may be told of how a Tigré chief got possession of one of these mountains, which by right belonged to him, but which, being a rebel, he had left in charge of some monks. The monks having collected great wealth and vast supplies of provisions there, were loth to give it up, and made loyal protestations of their duty to the ruling powers, their excuse.

The post was very important to the chief at that time, and the stores, which were for the most part the revenue of his own hereditary province collected in his name during his absence, still more important for his hungry troops; but in vain he tried every scheme to get his own again.

Force was out of the question, as the monks had only to draw up their rope, and setting at defiance the best army in the land, hold out for a longer period than any rebel troops could venture to beleaguer them. So the chief pretended not to care for it, cultivated the friendship of its occupiers, and even deposited some more of his property in their safe keeping.

After a considerable time, happening to pass the mountain, he expressed a wish to see the convent. The abbot granted his request conditionally that no one but his shield-bearer should accompany him. He mounted, visited the place, talked of sending more property, and made himself so agreeable that the reverend brethren proposed some refreshment. He feared he had not time, must be off, &c., &c., but being pressed, at last consented to accept their hospitality. The monks regretted they could only offer him a mutton repast. That difficulty was easily removed. They were not at all averse to good fare, and a fine fat cow which the chief had below, was ordered to be hauled up. In every great Abyssinian house each department has its particular servant, who has an indefeasible right to his particular perquisite. I have published all these details but have not space to give them here, suffice it to say that the cow could not possibly be killed, or the raw meat served, without the presence of the Chieftain's butcher, butcher's mate, server, and knife cleaner. As a matter of course, they accompanied the cow. The convent beer was good, but there was first-rate mead below, so to please the convivially disposed brethren, a supply was sent for, and brought up, accompanied, of course, by the brewer, pourer out, and waiter. And as the monks grew more merry and less wise, spirits and various other things were suggested and ordered up for their benefit, each article accompanied by its proper attendant. Drinking led to a desire for music and dancing, so the

chief's ambilta or reed band was sent for, and thus, one by one, a good party of well-armed men found their way up, just to please the pious monks.

The chief said nothing till the abbot suggested that it was getting late and time to break up, on which he replied in the tone of a polite host, begging the brethren to stay a little longer, it was yet early, they must finish another jar of mead, but if they must go, he hoped that it would not be long before they had another jolly evening together. The drunken abbot, monks, and lay brethren stared about them at this rather too polite invitation, and to their dismay perceived, that not only they themselves had hauled up a large party, but that these, profiting by their merry-making, had in their turn hauled up all their comrades. The monks began, some to weep, some to bluster, each according to the particular stage of intoxication in which he happened to be. The Lord Abbot swore he wouldn't go, but the chief persuaded him and his brethren, by hinting that there was a speedier way of reaching the bottom than by the rope.

Axum and Adoua, the ancient and modern capitals of Tigré, seem to stand on a plain with lofty hills rising from it, yet their heights above the level of the sea are 6,000 and 7,000 feet respectively. Gondar, capital of the Amhara country, stands rather higher than Axum, and the lake Dembea (or Tzana) is at about the same altitude as Adoua.

The fact of its being a lofty plateau is realised, when after travelling for many days over the seeming plain, you come suddenly on one of the deep valleys by which it is intersected. The River Mareb in Tigré, and the Taccazy, which forms the natural boundary between the Tigré and Amhara countries are the chief of these valleys, which are *sometimes miles broad*, descending some thousand feet by steep rocky slopes, covered with jungle, to the broad river bed below; sometimes comparatively narrow, with perpendicular rock sides, like vast rents in the ground. The mountains of Simyen spring from the west bank of the river Taccazy, their highest peak rising 15,000 feet above the level of the sea and 12,000 above the nearer portions of the river-bed. Patches of snow or hail of much greater extent than those on the Sierra Nevada, lie on its summit during the greater part, if not the whole, of the year. The Tigréans east of the Taccazy, differ in language, and, to a certain extent, in dress, manners, and customs, from their neighbours, the Amharas, on its western bank. The Tigré language nearly resembles the ancient Giz, or Ethiopic; while the Amharic is either a very corrupt dialect of the Giz, or a distinct language, with a good many Ethiopic roots introduced into it.

The general plateau drops from its eastern edge several thousand feet to the strip of low land lying between it and the Red Sea, on the north toward the Nubian basin of the Nile, on the west and south to that of the Abai or Blue Nile.

It will be readily understood that with such variety of altitude, a country lying between the 10th and 15th degrees of north latitude, must enjoy almost every variety of climate.

The fir, thorn, and blackberry abound on the mountains of Simyen and

Woggera, and on the high plains of Gojam to the south. Fleas, too, are plentiful in the first-named district.

The middle range would grow almost every kind of European fruit or corn.

In the few places where the vine is cultivated, it thrives luxuriantly. Wild olives, oranges, lemons, and various kinds of stone fruit are frequent. In the neighbourhood of Lake Tzana, rice and the sugar-cane now grow wild, possibly having been cultivated there in former times. Indigo has been tried with success; cotton of very fine quality is grown in many parts; a large quantity of coffee is exported from the neighbouring Galla countries to the various ports of the Red Sea, whence no doubt, a portion finds its way to Europe as "real Mocha."

In the more temperate altitudes, the mimosa, jessamine, and Cape plants bloom in profusion, while the monkey bread-tree, tamarind, bamboo, and various orchidaceous plants luxuriate in the hot-house climate of the lower valleys. It is the same in point of salubrity. An equable, though warm temperature, makes the middle and higher districts as healthy as need be, while at certain seasons of the year, nothing could be more deadly than the lowest ones. The unhealthy season is obviously after the rains, which fall in the highlands between June and September, and on the seaboard about two months earlier.

Tropical rain is not like our April showers; in one hour as much will fall as in three of our English thunder-storms. The earth cannot absorb it fast enough; in a few minutes the tiny rippling stream becomes a torrent, tearing down the mountain side, carrying with it its quota of what has made, and is still making Egypt. Scores of such torrents fall at once into their carrier, or secondary stream on the table land. I have crossed one of these in the morning, when it contained hardly water enough to wet the soles of my feet, and gone to see it in the afternoon when it was roaring down, many feet deep, and carrying away cattle, haystacks, and the remains of huts which it had destroyed at some higher part of its course, where it had overflowed its banks.

These secondary streams in their turn rush into the main valleys, each of which thus collects the water-shed of a vast tract of country.

In many places the Mareb and Taccazy are in the dry season merely rivulets, scarcely trickling between wide belts of sand bordered by thick jungle. When the sudden supply of water reaches them, they overflow both, in a broad red flood. The rains ending, they as rapidly return to their former bounds, and a rank vegetation springs up in the hot steam from the decaying remains of last year's growth.

The same thing occurs, even without the inundation, in the northern and western plains of the lower levels; and nothing can be more rapidly fatal than this poisonous malaria from decaying vegetable matter.

We may now hope that the expedition will be well out of the country before the dangerous season sets in; but though not generally of the worst form, there is often a good deal of fever on the coast about this time of the year.

With this rough sketch of the general features of Northern Abyssinia, I will turn to its inhabitants.

The Abyssinians are a mixed race. The word Abyssinia is probably derived from their native name Habash, which, I believe, in the Giz, or ancient Ethiopic language, means a mixture. In some of the provinces of Tigré, a mixture of various qualities of corn is called Habash to this day.

They count among their progenitors many settlers from various countries. Tradition alledges that a number of *Jews* followed the Queen of Sheba when she returned from her visit to Solomon. Numbers more are said to have taken refuge in Abyssinia at the various periods of Jewish troubles. Under the Ptolemies there were, no doubt, a good many foreign settlers. The early Christian Greeks sent missionaries, accompanied, it is said, by many artisans and adventurers. Then the Portuguese sent an expedition to assist the Christians against the invasion of the Mohammedans, and many of the soldiers settled in the country. The marks of a mixed race are very clear in the variety of stature and complexion. In a pure race, such as some on the White Nile and interior of Africa, there is great similarity in form and feature, almost identity in colour, and a remarkable evenness in size. In some tribes that I have seen, almost every man is within an inch or two at most, of the height of any other man in the tribe; some races being all very much below what we should call average height, others as much above it.

But the Abyssinians are, like ourselves, very varied in all points. In stature they run from 5 ft. 2 in. to 6 ft. 2 in., or even more; in colour, from almost jet black to almost as fair as an Egyptian; and the difference is remarkable, even in brothers and sisters of the same parents. I have often seen a jet black brother, with a nearly white sister, and *vice versâ*. I once lodged in the house of a man whose skin was of the mildest *café-au-lait* colour, and whose features were remarkable for a high forehead and a far more prominent nose than even Punch ever ventured to give himself or the Iron Duke. His sister was hardly so fair or well favoured as a Nouba slave. Both their father and mother were alive, the father very like the son, the mother quite as fair; but on inquiry I was told that their grandmother was dark.

Generally speaking, both men and women are remarkably well made and good looking, often handsome in feature. There is not the least appearance of the west coast negro in either form or feature. The men are usually deep chested, and models of symmetry upwards. Sometimes they fall off a little in the feet and legs, but so slightly in comparison with the genuine negro, that I attribute it to hard work and going barefoot from their childhood. The same may be said of the young girls. Like the women of all hot climates and slight costume, they age very rapidly, and are sensible enough, therefore, to exchange the becoming semi-nudity of their girlhood for a long loose robe, which entirely conceals the figure before its beauties are likely to fade. For dress, the men wear, cotton pantaloons, tight fitting, and reaching, according to the fashion of the country or the taste of the wearer, either to a few inches above, or a few inches below the knee. There is ten times as much fashion and fancy among the fast young men of Abyssinia in respect of the cut and stitching of these very simple

nether garments, as among the most exquisite of European Exquisites, in respect of their more elaborate costumes; and an experienced eye can as readily detect a soldier or townsman from a country bumpkin by the cut of his cotton, as he could in Europe by the cut of his cloth. A cotton belt, varying from 15 to 60 yards in length, by a yard wide, and a large square white sheet, with a red or blue border, worn very much after the manner of the Roman *toga*, and possibly in imitation of it, completes the costume. A belt 60 yards long and a yard wide, may seem an extraordinary article of clothing, and certainly implies a vast amount of turning round and round on a pivot when getting into it. But the weight of cotton does not increase with length, the longest being exceedingly fine and expensive, and therefore worn only by rich men. An ordinary gentleman's belt would be about 30 to 40 yards. It is worn as a sort of defensive armour, and serves to protect the lower part of the body from anything but a bullet, or a very well delivered lance.

The sheet, or "quarry," as it is called, is the cloak by day and the bed by night. When on a hunting expedition, or fighting, it is laid aside, and a piece of velvet, or the skin of some animal, worn in its stead; great warriors wearing the lion's skin, or a velvet mantle covered with silver ornaments. There is much fashion, too, in the skins that are proper to wear and those that are not so. Among the most fashionable are those of the lion, black panther, cat-leopard, and of a particular sort of jackal; the most usual of all and much esteemed is that of a peculiar sheep. All these skins are cut so as to hang in broad or narrow strips round the wearer; they are lined with red cloth or chintz, and the top edge bound with red morocco, stitched with gold and silver tinsel threads, and clasped with a double row of green and red amulets, the ends of the leather binding, hanging from them so as to have somewhat the effect of the bow and ends of an English lady's bonnet-strings. The skins of the dog and hyena are never worn; those of the leopard, only by a sect of dervishes in Northern Abyssinia, though they are in vogue among the Galla and Shoa soldiers; those of the ordinary domestic animals only by small farmers and their ploughmen.

I must return to the peculiar sheep whose skin I before mentioned as being the most esteemed for ordinary wear, because the animal itself is rather a curiosity in natural history. The skins are brought from the Galla countries of Yejjo and Wara Himano. Although, as a rule, the sheep of hot climates have no wool, but short hair, like a goat, and I believe it is true that sheep imported with wool, in the end lose it, yet this breed has extraordinarily long and straight wool of beautiful softness.

Some years ago I told a friend of mine who is much interested in farming, that I had measured wool of the length of a cubit and a span and three finger widths; or about 2 feet 5 inches. He said nothing at the time, but two years after confessed that he had taken my statement as a traveller's tale, never having seen, read of, or heard of such wool in any part of the world. I am quite prepared that many here present should hold the same opinion as he did; but at the same time that he confessed his scepticism, he made the *amende honorable* by

presenting me with a card, on which was wound a lock of wool, grown on the back of a Lincoln sheep during the two years of his infidelity, and measuring a few inches longer than my statement.

The Galla skins are generally dyed black, when not naturally so, but are sometimes worn in their natural brown and white. I have been told that the sheep are fed on meat and milk, and kept always on couches, their wool being regularly combed and tressed. In such case their lives are like those of some individuals of a higher order in natural history, devoted solely to outward appearance, and I am credibly informed that in both cases, when the superficial beauty goes, there is nothing left worth having. At any rate it is so in the case of the sheep, for when skinned, there remains nothing but a muttonless skeleton.

The native weapons of the Abyssinians are the lance, sword, and club. The lance-heads are of various patterns, but in later days they have shown their judgment in giving up the flat broad head for the square or diamond-shaped. The shafts are of tough pliant wood, of natural growth, or sometimes of the solid bamboo, and are balanced by a roll of iron on the butt. Many of the Abyssinians are tolerably expert in throwing the lighter sort of lance or javelin, striking an object from 30 to 40 yards distant with much precision. Two great chiefs in my time were said to have thrown a lance over the extraordinarily large tree, and column at the town of Axum.

The heavier lance is most generally used, and is never allowed to quit the hand, though it is often thrown at the enemy, sliding through the fingers and caught by the butt.

A well-delivered lance stroke will often pierce the toughest buffalo hide shield, and kill the man behind it, if he be awkward enough to receive the point square, instead of glancing it off by a side movement of his shield.

The shields are round, and nearly a yard in diameter, neatly made, not flat, but curving upwards from the edges to the centre. They are often ornamented with silver, and with strips of lion's mane, or a lion's tail, sometimes with brass plates, in the case of a poor but ostentatious soldier; this, however, is going out of fashion, as brass plates are seldom anything but patches to hide a bad shield.

The swords used in Abyssinia are either cheap showy blades imported from Germany, or home-made of the native iron.

The soldiers were getting rather tired of the German blades when I was there, for the somewhat sound reason that they were brittle. "If your sword break, where are you? But if it bend, you have only to sit upon it, and it's all right again." But whatever the blade, they make it perfectly useless by fitting it into a rhinoceros horn hilt, so cleverly constructed, that if, in striking, the wrist bend ever so little, a sharp point of the hilt inevitably pierces it. In consequence, though I have seen many sword-cuts on the head, I never saw more than the scalp injured.

The Abyssinians have no notion whatever of swordsmanship, either in the eastern way of dexterous cutting, or the European, of skilful warding.

Beside the ordinary sword, they have another weapon called a shotel, which is in form like an immense, and very crooked reaping hook. It is difficult to stop a blow from this weapon either with shield or sword, as the point will come down perpendicularly on to the head, while from its shape the middle of the blade is two feet above it. To counteract its dangerous nature, it is such a clumsy, top-heavy article, that it is a very difficult matter to direct a blow with it. Both sword and shotel are worn on the right side, buckled close to the waist, and sticking out behind like a tail. The scabbards are, where it can be afforded, of scarlet morocco, sometimes patched with silver, and always continued a foot longer than the blade to a narrow point, which is turned up, as if to add to the tail-like appearance. At the end of this, the shotel has a round ball of silver as large as a walnut, while the tongue of the blade of both sword and shotel is clenched at the butt of the hilt by a dollar, or a silver filagree ornament called a timbora.

The natives themselves appreciate these weapons as ornamental, rather than useful. They say:

> "A great long shotel, with its silver ball,
> "Goes down with the women, and that's all—
> "A first-rate sword with its silver knob,
> "Goes down with the women, that's its job."

Great chiefs, on state occasions, and in battle, wear coronets and large bracelets of silver, chains, amulets, and other ornaments.

The dress of the women is simpler than even that of the men. Young girls wear nothing but a piece of cotton cloth wrapped round their waists and the end of it,—or in some provinces of Tigré, a black goat-skin ornamented with cowries,—thrown over the left shoulder; when they marry they change this costume for a long cotton shirt, and a sheet or quarry like that of the men. Both sexes plait their hair, which though woolly is long, flat on the head, from the forehead backwards, leaving ringlets hanging behind the neck, or sometimes a few on the temples.

Formerly young soldiers were not allowed to tress their hair till they had killed a man, when they shaved the head, all but enough for a single plait round it, a braid being added for each man killed till the fifth, when they were allowed to tress the whole head. Now-a-days, except in some of the remoter Galla districts, the number of tresses depends on the age of the wearer, rather than on his prowess. Young men and women usually shave the crown; while mothers and full-grown men plait the whole. Ladies have butter neatly dabbed on their hair, and then some sort of scent sprinkled over it, but the correct thing for a dandy is to appear in the Rotten Row of the country with a huge pat of butter placed on the top of his head, which gradually melting in the sun, runs over his hair, down his neck, and over his forehead into his eyes, causing them to smart disagreeably, if he forget continually to wipe his brow with his hand or his "quarry."

As may be imagined, the dresses of neither women or men are

long free from grease; but this is by no means considered important, especially among the men; on the contrary many young soldiers consider a clean cloth as "slow," and fit only for a woman or a citizen. In consequence they never wash their "quarries," and seldom themselves, except on St. John's day, which happens to come only once a year.

Tattooing is a custom imported, I imagine from the Gallas, as a great many Amhara ladies tattoo, and but few Tigréans.

Men are seldom more ornamented than by a design on one arm near the shoulder, but some women tattoo their shoulders, necks, arms down to the finger nails, ankles, and feet, nay even their gums, which are sometimes all blue, sometimes striped blue and the natural pink. From paintings in the temples of Egypt, we learn that ladies were in the habit of discussing their earrings near 4,000 years ago. I have been among blacks, whose ladies wore no clothes; but I have never yet been in any country white or black, clothes or no clothes, where the women did not wear some trinkets or jewellery of some kind or other. The Abyssinians are not at all exceptions, they wear a large silver hair pin in the hair, not for the real or assumed purpose of holding the hair together as in Europe, but for the simpler one of scratching. They have literally "rings on their fingers," which they cover almost to the nails, with silver or alternately silver and gold rings, and almost literally "bells on their toes," for they wear three pair of "bangles" on their ankles, and over the instep to the heel a number of small silver plates hung by chains to a silk cord, which jingle like bells as the wearer moves her foot. Beside these, an Abyssinian lady of fashion will wear three or four pair of silver bracelets, and half-a-dozen silver chains, suspending a large silver box, like a card-case, supposed to contain a charm, but more commonly some scented cotton wool.

They darken their eyelids with antimony, stain their hands and feet with henna, and make use, I believe, of various other aids to nature, almost as much as some English ladies.

I fear I cannot give a very high opinion of the Abyssinian character. They are savages with a sort of traditional smattering, not of civilization, but of Eastern barbarism. They have most of the vices of the savage without many of his virtues, and a good many of the vices of civilization without any of its advantages. They are not generally hospitable, are great beggars, generous in giving only when they expect a two-fold return; excessively polite in their forms of salutation, very coarse in all their ways and manners, vain, but by no means proud; pugnacious, but by no means brave. Still, I think, one must not be too hard with them, their faults are rather negative than positive, and much allowance must be made for the incessant state of insecurity in which they live and have lived for centuries from constant rebellions and changes of government.

Personal vanity certainly is a remarkably besetting weakness—"*in vino veritas*"—and the first symptom of the effects of liquor on an Abyssinian, of even the lowest rank, is that he begins to assert his greatness and other merits. Nine quarrels out of ten over the cups, begin by a man saying to his neighbour: "I love you very much, but

you are not half so brave or so handsome as I." In other characters the same feeling will take another place—a tipsy servant will believe himself a very great chief, seat himself in a dignified posture, and order his fellow-servants about, reproving them for peccadilloes they have probably been really guilty of, and which thus sometimes come to their master's knowledge.

As for mock politeness and begging, what I mean may be gleaned from the manners of a soldier or confidential servant of the upper class sent with a message from a great chief. He will enter your room with his shoulders bared in token of humiliation, and as if bashful in the presence of so much greatness, will pause timidly at the door, bowing low at your repeated salutations and invitations to seat himself. At last, as if having gained sufficient courage to speak, he will inform you that his master Goetana Ito so-and-so, sends you his salutations and "Good morning, good morning. How are ye since I saw ye? How are ye? How are ye? Very much!" On your answering "God be praised" he will make another bow and remain where he is. After a while he will consent to sit on the ground, in the lowest place in the room, but with great show of disinclination to take such a liberty. Then he will get up again and approaching a little nearer, deliver some other message of empty compliment. This time he will seat himself near your couch unasked. After a few moments he will rise again, and give you, in a confidential whisper behind the corner of his garment, the real purport of his visit, probably such as this:—"My master, Mr. So-and-so, sent me to you to say How are ye (&c., &c., *ad infinitum*), and to present you with this!" On which, with the greatest mystery, he pulls out from under his cloth a very small jar of honey, which his respectable master had probably filched from some old woman for the occasion.

But though I said this was the real purport of his visit it was only the ostensible one. The business, however, being transacted, he will advance by degrees both in his impudence and nearness to your seat, till, if he think he has gained favour in your sight, that is if you are anything but stiffly courteous to him, he will very likely arrive in time at the point of dropping accidentally on the edge of your seat, and at last of sitting comfortably alongside you; then, all his humility disappearing, he will arrange his garments as pleases him best, and making himself perfectly at home, tell you stories of his own and his master's greatness, and of their particular attachment to you. Retiring at last, when your mead is exhausted, he reassumes his mock humility, and begs you to name from your servants one who shall be his balderabba, or mediator with you. To him he confides the real object of his mission, and it becomes the balderabba's duty to hint to you that your particular friend Mr. So-and-so, from whom you have received 6d. worth of honey, which cost him nothing, is very much in want of a Turkey rug, a few yards of velvet, or scarlet cloth, or perhaps of all.

As to courage, it is a very difficult matter to decide upon, there being so many varieties of courage, so much dependent on habit. The Abyssinians, as I said, are very quarrelsome, coming to blows for the merest trifles, but although lances, swords, and clubs are the weapons

used in their quarrels, dangerous wounds seldom occur except when the combatants are madly intoxicated.

I should say that the Abyssinians are undoubtedly less brave than many tribes near them, for instance the Baza on their northern frontier and the Arab refugees adjoining them. This may depend a good deal on their mode of life. They are less accustomed to self-reliance than men who live by their own hands in the backwoods. Still I have known striking instances of individual courage, of two sorts—one that required to dash suddenly on a vastly superior but unprepared enemy, the other stolid indifference to physical pain. There were four chiefs about the time of my visit who were celebrated for both these sorts of courage. One was a *beau sabreur*, named Gurra Rafaël, a most daring and impetuous cavalry leader, who shortly before my arrival had been cruelly murdered, by the order, it was asserted, of another of the four, namely, the Balgadda Araia, a claimant of the throne of Tigré. Gurra Rafaël was taken by stratagem, his eyes burnt out by a blacksmith, and then he was stabbed; to the last he never uttered a complaint, but only taunted his murderers and shouted his war cry.

The Balgadda was a sort of Abyssinian Robin Hood; when in rebellion he was always where he was not expected, and never to be found where he was "wanted." He seemed to have a most wonderful system of espionage in the camp of Dejatch Oubi, who then ruled Tigré by conquest. He not only made successful dashes on the enemy's troops, cutting off detached bodies and supplies, but when nothing of the sort was to be done, used to play tricks on Oubi and his chiefs, as if for mere amusement sake, or to keep them in a state of nervousness.

Once a General of Oubi's, at a feast in camp, ridiculed the Balgadda, saying he could not be called a General, as no one could tell how he could command an army, and sneering at the feats for which he was so much celebrated, comparing him to a kite, which dashes on its prey, seizes it, and is off again; boasting also of the great things he would do if set to catch him. All this passed in the Amhara camp, and doubtless the boaster never dreamt that it would reach the Balgadda's ears. One morning, however, on awaking, he found that in spite of guards and watchmen some one had entered his hut during the night, drunk up the mead that stood by his bed, carried off two favourite guns, and left a drawn sword across his bed head. Strict enquiries were made among the soldiers but no one could guess whom to suspect of so daring an act. The theft became a nine days' wonder in the camp. A few days after, when the matter had been well talked about, a countryman (Araia himself in disguise, it was said by some people) asked to see the General, and returned him his guns wrapped in a bundle of cotton cloth, with a note from the Balgadda, complimenting him on the quality of his mead, but not on his watchfulness, and begging him to send him back as a present one of the guns, which he returned, though he had every right to keep them, as taken from an enemy.

The other two chiefs were, oddly enough, the two men whom I alluded to as throwing a lance over the great tree at Axum: Desta and the Nebrid Welda Selassey. Both had the reputation of brave leaders in the fight. Desta being taken as a rebel, was sentenced to lose his

right hand. The operation is performed with a soft iron knife, rudely sharpened on a rough stone or file. Desta coolly spread his fingers to make the operation easier, and allowed his hand to be sawn rather than cut off at the wrist, without flinching or showing the least pain in his calmly smiling face. When it was off, he took it up in his left hand, threw it at the chief who presided, saying, with the utmost coolness, "See, I have still a hand with which I can cast a lance," and then, with as little hesitation as if about to wash, thrust the stump into a vessel of boiling butter provided for stopping the hæmorrhage.

The case of the Nebrid Welda Selassy is too horrible to relate, but he bore it with the same stoic fortitude. Though, being old, he died shortly after. But these are nothing to instances I have known, where blacks, beaten in battle by the Abyssinians, have lain down shamming dead, though unwounded, and submitted to the most horrible mutilations without giving the smallest sign of life. I cannot look upon this sort of physical endurance as a question of courage. It is more the habit of not believing in it. Men get as used to the notion that pain is only painful when it produces inconvenience, as "eels to skinning," or epicures to the belief that Epsom salts are nasty and olives nice. It's all habit. I remember a great big Galla coming at me with a club when I was unarmed. I stopped his blow and countered him, English fashion, under the left eye. Two things surprised me; first my blow produced a lump like an egg; secondly, he did not get up again, but squatted on the ground, crying like a child, and going through his war boast: "I have killed Shangalla, two men at such a battle! one man at such another! &c., &c., &c., and here I am dying of medicine!" If I had fractured his skull with a club, he would have thought nothing of it, but to be knocked down with nothing was impossible—it was "magic."

But the most singular case of a brave man becoming a coward when out of his element, that I ever witnessed, was that of a Bedouin chief, one of the bravest men, in his own desert, that I ever met. In his almost boyhood he had been left with two other youths in charge of the camp and women, while the men of the tribe went to water the flocks and herds at some distance. A party from a hostile tribe seized the opportunity and fell on them, the two other lads were at once killed; my friend Ali, severely wounded, scratched a line on the sand, intimating that he would not quit the mark, and fell on it, almost hacked to pieces, just as a party of his own people returned unexpectedly. He recovered, as a desert Arab only could recover, and years after, when I stayed with him, I could not only wonder at his wounds, but had many opportunities of seeing his cool daring when hunting or scouting alone with him among the hostile tribes on the frontiers of Darfour. His tribe had kept in the desert out of the way of the Turks, and so had shirked their tribute for two years. The season had been very dry, the cattle wanted pasture, and they dared not go down to the Nile, lest the Turks should make them pay their arrears tenfold, and punish them besides. So I proposed to take him to Dongola with me and intercede for him with the then Governor, Moussa Pacha, whom Sir S. Baker abuses so much, but who was a very dear

friend of mine. The moment the Beddawi got into the clearings he was another man; he could hardly speak, or eat, but sat cowering, with his cloth over his head, like a woman. He was afraid of houses, of boats, of small-pox, of everything he saw, but, most of all, one dark night, when we were poking our way to a village through a fog, of some unknown animal which, roaring in the most unearthly tone, kept just ahead of us. He thought it was the evil spirit leading us to some unknown, and, therefore, terrible fate. Had the devil appeared as a roaring lion, he would not have minded him in the least; the roar was unlike anything he or any of our party had ever heard. It was, as we discovered on our safe arrival at our destination, that of a very old she-ass suffering from a severe cold.

Dejatch Carsai, known in the Expeditionary Force as the Prince of Tigré, is a good horseman, and in his youth even, was remarkable among his countrymen for courage, yet a gentleman present tells me that his abject terror on being treated to a ride on one of our elephants, was something too ludicrous to conceive.

An Abyssinian battle generally begins by a few horsemen galloping out from one army towards the enemy, brandishing their lances and shouting their war cries. As they approach, a party twice their number meets them; the first comers throw a lance or two and turn tail as hard as they can, till they meet a still stronger party of their friends coming to assist them, then the pursuers turn and are pursued, and so it goes on with very few casualties, till something occurs; a great chief is accidentally shot, or taken prisoner, tipsy or asleep, by a party that has managed, unperceived, to turn his flank; on which his army is seized with helter-skelter panic, and then the real business of the "splendid cavalry" begins. They pursue and murder the fugitives for miles, for the sake of obtaining trophies, not unlike the Red Indian system of scalping. Many instances have occurred within my knowledge, of soldiers having murdered their comrades or poor peasants for the sake of these proofs of valour, which are exhibited to the King or chief at a great feast after the battle.

This boasting scene is very wild and picturesque, and very like what Catlin describes as "counting their coups," among the Red Indians. The chief sits in state and each successful soldier in turn stalks before him dressed in all his finery. At first he begins quietly, strutting backwards and forwards, brandishing his lance and repeating his master's name, war-cry, and the colour of his horse; then describing himself and his lineage, gradually works himself up to a sort of phrenzy, in which he stamps about, screaming all that he has done for him, how many men he killed on former occasions, naming each battle, and ending by throwing down the trophies taken in the last action, and bowing low before his master. The chief rewards each man according to his merits and rank, with gifts rising from a silver bracelet, a sword, or a horse, to a government.

I have witnessed cases where trophies had been gained by foul play which, being discovered, unknown to the perpetrator, he was allowed to go through his boast with the rest, receiving his deserved reward instead of the one he hoped for. But though I have published

one or two instances of such summary executions, in a book where they may be skipped, I refrain from giving them on the present occasion.

The great difficulty in describing to civilized people the manners and customs of savages is, that one is unable to tell the most singular and striking differences between their customs and ours, without relating what might shock one's hearers. On the other hand, if one confines oneself only to matters in which they do as we do, the narrative must of necessity be dull. I could relate frightful scenes of barbarous cruelty. I have said enough, however, to show that they are cruel, according to our notions, in punishment. I may add that they are the same in extorting money from the peasantry, on any pretext whatever. It is sufficient to be rich to excite suspicion, and suspicion once aroused, a pretext is soon found for a prison, with an iron bracelet, which, used as an instrument of torture, is periodically hammered closer and closer, till, if the sum required be not forthcoming, the prisoner is maimed for life, which often, under the circumstances is not of long duration. The minor chiefs and detached soldiers quartered on the villages carry out the same system in a small way, to procure for themselves what they choose to ask for. But it must be admitted that however hard they may have been themselves, almost all the princes I have known or heard of, from Oubi to Theodore, have been most ready to punish in the severest manner any outrages by the common soldiers on the peasantry.

Murder and violent robbery are by no means common, except in the legitimate way of making war on one's own account; and this is the more creditable in a country where a man can often in a few hours slip over the frontier and place himself out of harm's way.

Civil disputes are settled in a singular way, before the district chiefs, with appeal to the supreme chief.

They have a sort of self-taught counsellor, who is called a "Magwatch," but who is neither educated for the profession nor called to the bar, but is merely an ordinary man with an extraordinary gift of the gab. These men are sometimes employed in heavy cases, but not otherwise, as almost every man in the country is more or less gifted in that respect. If two persons have a dispute on ever so small a matter, one, getting excited, proposes to refer it to the Chief, a servant of whom, is at once sent for. He ties the corners of the disputants' garments together, and holding the knot in his hand, walks between them, first adjuring them by the back of the King, and by that of the Chief, that neither speak by the way. To disobey this order is a forfeit of not exceeding nine dollars to the Chief.

Arrived before the Judge, liberty of speech is given, and the servant still standing between them, the accuser begins by binding his opponent under the same penalty not to speak, or advance foot, or raise hand till he give him permission. It is rather hard for a hot-headed man to hear himself abused, and what he believes to be false, stated by his enemy; but unless he would pay the fine, he must do no more than give vent to his feelings, as he is allowed to, by grunting "Em! Em!" which he does in every imaginable variety of tone.

At last his turn comes, and he vindicates his pent-up feelings in a proportionally excitable reply. Witnesses may or may not be called; but the most absurd custom of the whole, though the most lucrative to the Chief, is the system of betting on evidence.

Suppose for instance the case be on the ownership of land, a very common cause of dispute where title deeds are traditionary. One man will say: "This land was held by my father, grandfather, and great-grandfather, from the days of such and such a former king! On it a mule!"—or sometimes ten mules, each of which is considered as ten dollars. If the other accept the wager, the loser pays the money to the Chief. If the party challenged be poorer than the other, he may reduce the amount. "I cannot afford a mule; on it a cow!" or any other article of value may be named.

I have often heard wagers laid of far more value than the matter at issue. Once I remember 100 dollars being lost on the question between two farmers as to which ought to pay a certain small tribute of corn of the value of a shilling or two.

Sometimes questions, usually such as small debts claimed and denied where no witnesses can be produced, are decided by oath. There are various modes of swearing, the most solemn of which is in church. The swearer is taken into the outer circle of the building where the bodies of the dead are laid previous to interment; he is there rolled in one of the mats used as coffins, and lying there, he calls on God to bear witness to him, and to grant that should he have sworn falsely he may return at the end of three days, or of seven at the most, to the mat on which he is lying, never to leave it more.

This sort of oath, or even calling on the saints, is looked upon as more or less disgraceful in money matters, and men of good repute will generally hand the sum claimed to a third person, to be paid to the claimant if he will swear to the justice of his claim.

A man convicted of perjury not only loses his good name, and is for ever forbidden to bear witness in any matter, but would most likely be imprisoned and fined, and would be lucky if he regained his freedom with all his members in their right places, and without his hide being scored to the pattern of roast pork by a solid leather plough whip, well described by its name, the "giraffe." This whip is the minor punishment to cutting off the hand, in the lighter kinds of theft and other offences. It is applied very efficaciously. The culprit is brought into the market place, stripped to the waist. A man on each side holds him by a long cord tied to his hands, while a third, brandishing the formidable giraffe, walks behind him. In this procession he is led about among the people, and forced to exclaim between each blow, which falls with fearful force and at regular intervals, "All ye who see me thus, profit by my example." For some crimes, such as sacrilege, witchcraft, &c., hanging or burning is resorted to, but the punishment for murder and wounding is strictly carried out on the principle of "an eye for an eye, and a tooth for a tooth." Even when a person kills another accidentally, the law gives the relations of the deceased the right to kill the man who accidentally killed him, but in exactly the same manner only. The story of Don Pedro the Cruel's judgment on

the mason who fell from the scaffold and accidentally killed a passer-by without injury to himself, is told in Spain; and the same story is told in Abyssinia as having occurred in the case of two little boys, one of whom climbed a tree to gather its wild fruit, while the other remained below to receive it. The bough broke and the boy fell on the head of his comrade below, and killed him. The parents of the dead boy insisted on his being tried for his life, and he was found guilty. But as he must be killed precisely as he killed the other, and by the nearest relative of the deceased, it became necessary that the dead boy's little brother should climb the tree and tumble down on his head. But then arose the possibility that he might miss his mark, or, at any rate be as much hurt as the culprit, so his anxious mamma preferred compromising the matter by a few dollars. The books of Moses are the basis of all the Abyssinian laws and religious customs.

The professed religion of Northern Abyssinia is Christianity. There are a few Mohammedans and Falashas, or Jews. Abyssinian Christianity is, however, among the people generally, merely the Jewish religion, with a few Christian names and forms superadded. They practice circumcision, and have all the ceremonial of cleanness and uncleanness, and purification, as laid down in Deuteronomy. The same in regard to meats which are or are not to be eaten; of the latter, the hare, camel, and pig, &c., &c. They, however, are not generally aware of the origin of their prejudice, but ascribe it to some absurd tradition. For instance, the hare is supposed by some to feed on the bodies of dead men; and the camel is a Mohammedan animal. Many, however, will not eat the flesh of certain animals, generally considered clean. These are family prejudices, for which they can assign no reason but that, like the descendants of Jonadab the son of Rechab, some ancestor had forbidden it.

In slaying their cattle, too, the beast must be thrown down, with its head turned to Jerusalem, and its throat cut while the Christian words, "in the name of the Father, and of the Son, and of the Holy Ghost," are pronounced.

Their churches are built with a holy of holies, in which is kept the ark; an outer circle representing the court of the priests, and one outside that, for the court of the Levites. It must be understood that, with the exception of a few stone churches, built by the early Portuguese, as at Axum, the temples of Abyssinia are merely round huts, divided as I have mentioned, and covered by a conical roof of thatch, distinguishable only from the ordinary dwellings by being rather larger, somewhat more neatly made, and often surmounted by a quaintly fashioned iron cross, sometimes ornamented with ostrich eggs. They are generally built in groves, on high places, as we read of in the Old Testament.

Like the ancient Jews, they believe in witchcraft, seers, possession by the devil, and in persons who can raise spirits and consult with them.

The trade of blacksmith is generally hereditary, and is looked upon with much the same feelings as in some countries the office of hangman is, from the belief that every blacksmith is, by virtue of his calling,

or some hereditary secret, a sorcerer. They are supposed to be able to turn themselves into hyænas, or other animals, at pleasure, and also to afflict and often kill people who may have offended them, by merely bending a straw and placing it, with some cabalistic words, under a stone. I have seen many very curious instances of persons so afflicted. The usual symptoms are dulness and refusal of food, followed by an apparent insensibility to pain or shock of any sort; the patient will on no account allow his or her thumbs to be taken, holding them tight in the hands, and has an irresistible desire to slip away unperceived whenever the hyæna's voice is heard. The bystanders suspecting the cause of the malady, procure charms, which are usually bits of herb and hyæna's fur, stitched in leather On the approach of a powerful charm, the patient, hitherto, perhaps, lying weak and helpless on the ground, starts up in a phrenzy, and struggles with such strength, that it often requires two or three strong men to hold even a woman. The charm forces the Bouda to speak, which he does in a language unknown to mortal men, till forced by the talisman to speak plainly, to declare his name, and at last to quit.

Among other pictures kindly lent to assist me in this lecture, I see one referring to an old story of mine, of a woman who was turned into an ass by a Bouda. The old woman died and was buried. After her burial a stranger came to the priest, offering a sum of money for the body, and promising secrecy. The priest was tempted, and the stranger went off with his purchase. The stranger, a blacksmith, was in the habit of passing the old lady's house on his way to market. After her death it was observed that he rode or drove a remarkably fine donkey, which oddly enough, on passing the house or any of the old woman's family, brayed loudly. For a time no notice was taken of this; but at last one of her sons came to the conclusion, from a kindred feeling, no doubt, that the ass was his late mother, and she and her owner were taken into the house. Here the donkey's maternal affection showed itself most clearly, by her rubbing her nose against the various members of the family. By dint of threats and promises, the Bouda was induced to confess the truth of their suspicions, to admit that the old lady had never died, but had merely been put into a trance by him for his transformation purposes, and to take the necessary steps to restore her to her pristine old womanhood. The ceremony was nearly concluded, one foot only remaining asinine, when one of her sons, unable to contain his anger any longer, drove his spear through the wizard's heart. The old lady lived for years, and many credible witnesses have assured me they had often seen her hobbling along on a human foot and an ass's hoof.

The Tigrituya is another form of devil, which exhibits itself in the sufferer wasting away and craving for music, dancing, and every sort of finery that can be conceived. After enough of this has been procured to satisfy the evil spirit, he will consent to leave his victim, who is taken out on the day fixed to a lonely spot, where a large party with music and dancing is assembled. The patient, usually of the fair sex, joining with the rest. When he has had enough amusement, the devil signifies his intention to quit, by the patient taking off her finery,

bowing her head and kissing her hands in token of farewell. She then starts at a pace which few men can equal, but which she can keep up only for 50 or 100 yards, when she falls insensible. The devil is supposed to have left her at that moment, and a party of active young men, who have been prepared, coming up, surround her, firing guns and brandishing swords and spears to prevent his return.

After the patient has drank water, she pronounces for the first time her profession of Christianity, words which, if uttered by another in her presence before the devil's exit, would have produced the most frightful results. A sheep is then killed, and part of it, broiled on the embers, eaten by the friends, the remainder left to amuse the devil if he should return to the spot. In this custom, and in that of passing animals round a sick person's couch, and then slaughtering them, we have traces of Jewish sacrifice. I have occasionally detected shams in these matters, but quite as often have seen or known of the sufferers dying while going through the absurdities I have mentioned. And it has often struck me as singular, that people should undergo so much suffering for no particular purpose, and still more so, that parents and masters, who themselves have been real or pretended victims, should put themselves to a great deal of inconvenience, and loss of the services of their children or servants for many days or weeks, if their own experience tells them it is a mere sham. I may refer any one who is spiritually disposed, to full details of these and other similar matters in "Life in Abyssinia."

The Christian element in Abyssinian Christianity is chiefly to be traced among the Churchmen, in their extraordinary fondness for schisms and theological disputings, and among all classes, in the numberless saints, whose names are continually in the mouths of the people. If fasting be of great avail, then no Christians are so Christian as the Abyssinians, for they have 154 days beside Wednesdays and Fridays, in all 258 days in the year, on which they may not touch food or water till late in the afternoon, and then only such wretched vegetable food as their country affords. Beside these regular days, a man must be very good who has not several more fasts ordered as penance by his confessor. However, they to a certain extent make up for this fasting by a great number of feasts which, the priests setting the example, generally end in riotous debauchery.

The Abyssinian's house is a low, circular mud and stone wall, with an opening for a door, and a conical roof of boughs and thatch. The only difference between the dwellings of the rich and the poor, is that in the country, the rich man has a greater number of such huts in his compound. In the towns they are sometimes made very large, and with an outer circle, which is divided into apartments, kitchens and other offices, sometimes square with a nearly flat roof. Lime is not used, and believed not to exist in the country. I have heard Europeans assert as much, but I feel persuaded that it is a mistake. The furniture of all houses consists of a rough stretcher or couch, the seat of which is formed of strips of raw hide stretched, crossing each other; a mud sleeping place, a few tanned hides, a wicker table, some

horns stuck in the wall to hang shield and lances on, and a number of sun-baked jars for corn and mead.

The Abyssinians are simple feeders. They have not, as a general rule, a chance of being otherwise. But when the chance occurs, they make up for lost time. Meat is a luxury, confined except now and then as a treat, to the upper 10,000. The poorer classes live chiefly on a spongy sort of cake, very much like a thin, but enormously large crumpet, of a dark brown colour, sourish and gritty to the taste, and made from a small dark seed called teff, or another called dagousha. This they swallow by aid of a mess made of ground lentils and boiled butter, and spiced with a fearful quantity of capsicum and onions, or with sour milk flavoured in the same way. They knead pieces of the cake into the sauce, and form it into pellets, like sausages, which they thrust into their own, or, if politely disposed, into their neighbour's mouths. To be much esteemed is to be three parts choked, and till accustomed to it, to suffer the loss of the greater part of the skin of your tongue and palate.

The feasting on raw beef is too well known to need much to be said on the subject. The animal is slaughtered at the door, and the flesh brought in while still warm (each particular cut being taken off by one man as fast as the skin over it is removed by another), and carried to the guests, who are squatted on grass laid down as a carpet round low tables covered with piles of the large cakes I have mentioned. The raw beef in great lumps is offered to the guests in succession, according to rank, by a servant who holds it in both hands, while the guest with his sword cuts off a long strip from the part he likes best, dips the end in a sort of capsicum paste, resembling chatny, and, holding it between his teeth, cuts off his mouthful by an upstroke of his sword close to his lips, and much endangering the tip of his nose. Mead and broiled meat are served after, and the feast goes on for hours. I should be afraid to say how many pounds of raw meat I have seen and heard of being eaten at one feast, and there is not an Abyssinian who, being in tolerable health, will not go to three or four such feasts, or more if he can, in one day. These feasts are usually on saint days, marriages, funerals, &c., &c.

When I say marriages it must not be understood that marriages are binding. The ceremony consists in a large number of the friends of both parties assembling. There is a great deal of dancing and raw beef, kept up for a night and a day. The bride has for her dowry twice as much as the bridegroom settles, and the marriage can be dissolved at any time by a division of the property so arranged. Some old people think it well, if they have lived long together, to go to church and take the Sacrament. But this is rarely done till the close of life.

There are many curious customs attending marriages, funerals, &c., but these cannot be given in detail in the limits of a paper.

I had intended saying something about the natural history of Abyssinia, but I find that I have already exceeded the time allowed me, and, in truth, on such a subject one cannot say much in a few words.

Almost all the beasts and birds described in Southern and Western

Africa are to be found more or less abundantly in Abyssinia and the neighbouring countries. Antelopes, grouse, and the smaller game of all sorts may be had in Abyssinia Proper, but a mountainous country is not to be recommended for large game. The best country I know for the sportsman is the district described by Sir Samuel Baker in his "Nile Tributaries of Abyssinia," a large country, or several countries, lying north of Abyssinia, and forming the southern boundary of the Soudan.